City of Ketchum
Planning & Building

STAFF REPORT
KETCHUM PLANNING AND ZONING COMMISSION
REGULAR MEETING OF JULY 11, 2023

PROJECT:	Pratt Residence
FILE NUMBER:	P23-009 and P23-009A
APPLICATION TYPE:	Mountain Overlay Design Review and Conditional Use Permit
REPRESENTATIVE:	Nathan Hecker – Farmer Payne Architects (architect)
PROPERTY OWNER:	Bradley and Gail Pratt
REQUEST:	Mountain Overlay Design Review application for the development of a new 5,939 gross square foot single-family residence. A Conditional Use Permit application is also requested for the avalanche retaining wall located at the rear of the proposed residence.
LOCATION:	406 Sage Road (Lot 23, Block 3, Warm Springs Valley Subdivision Fourth Addition)
ZONING:	General Residential – Low Density (GR-L), Mountain Overlay (MO), Avalanche Overlay (A)
REVIEWER:	Paige Nied – Associate Planner
NOTICE:	A public hearing notice for the project was mailed to all owners of property within 300 feet of the project site and all political subdivisions on June 21, 2023. The public hearing notice was published in the Idaho Mountain Express on June 21, 2023. A notice was posted on the project site and the city's website on July 3, 2023. Story poles were documented on the project site as of July 3, 2023.

I. EXECUTIVE SUMMARY:

The applicant is proposing to demolish an existing 2,016 square foot single family residence and construct a new 5,939 gross square foot three-story single-family residence (the "project"), located at 406 Sage Road (the "subject property"). The project contains four bedrooms and an attached two car garage. The subject property is zoned General Residential – Low Density (GR-L) in the Mountain Overlay District (MOD) and Avalanche District (A). A rendering of the proposed residence can be seen in Figure 1 below.

Figure 1: Rendering of Proposed Project

The subject property (See Figure 2) is part of the Warm Springs Valley Subdivision, Fourth Addition that was created in 1961 under the jurisdiction of Blaine County. The existing single-family residence on the lot was constructed in 1966 under Blaine County's development standards prior to the subject property being annexed into the City of Ketchum. At the time of construction there were no hillside development or avalanche standards, therefore, the existing home does not have any avalanche protection and was not sited or designed to meet the Mountain Overlay design review criteria.

Figure 2: 406 Sage Road (blue) Vicinity Map

The project is proposing to demolish the existing nonconforming single-family residence and retain the existing configuration of the property. While the existing structure is more than 50 years old, it is not designated on the City's adopted Historic Building/Site List. Review by the Historic Preservation Commission is not required; however, a demolition permit cannot be issued for the existing residence until a 60-day waiting period has concluded (KMC §15.16.040.B3) and a complete building permit application for a replacement project on the property has been accepted by the city and required fees have been paid (KMC §17.20.010.B).

Pursuant to Ketchum Municipal Code (KMC) §17.104.050.A, design review is required for the "construction or placement of new buildings or structures, including additions to any such structures or buildings existing at the effective date hereof, upon real property within the Mountain Overlay Zoning District." The project is subject to all Mountain Overlay design review criteria and standards specified in KMC §17.104.070 as well as all applicable design review standards specified in KMC §17.96.060.

Pursuant to KMC §17.92.010.D.2, the construction of avalanche protective, deflective and preventative structures "shall be permitted only as a conditional use." The proposed avalanche protective wall spanning the rear of the residence is subject to all applicable conditional use permit criteria specified in KMC §17.116.030.

Staff believes the project conforms to the zoning and dimensional standard requirements and most of the design review and Mountain Overlay design review criteria. Staff also finds the project to be in conformance with all conditional use permit criteria. Therefore, staff recommends approval of the Mountain Overlay design review and conditional use permit applications.

II. BACKGROUND:

The Planning and Building Department received the Mountain Overlay Design Review and Conditional Use Permit applications for the project on February 16, 2023. Following the receipt of the applications, staff routed the application materials to all city departments for review. The applications were reviewed concurrently, and the applications were deemed complete on May 26, 2023, after two rounds of review.

III. CONFORMANCE WITH ZONING AND DESIGN REVIEW STANDARDS:

Prior to granting Design Review approval, the Commission must determine that the application meets two criteria: (1) the project doesn't jeopardize the health, safety, or welfare of the public, and (2) the project conforms to all Design Review standards and zoning regulations (KMC §17.96.050.A).

Criteria #1: Health, Safety, and Welfare of the Public

The 2014 Comprehensive Plan contains the community's vision for Ketchum and sets goals and policies to guide future development. The vision is shaped by 10 core values identified by Ketchum residents as important to consider for all future land uses decisions. The community's core values include protecting the community character of Ketchum and preserving its environmental quality and scenic beauty. Ketchum's undeveloped hillsides are visual assets that define the character of our community. Protecting and preserving Ketchum's natural resources is critical to maintaining our economy, quality of life, and community identity. The comprehensive plan states:

Community Character: You know when you have entered Ketchum; this is a place centered on the "town" and identifiable from the "country" by distinct edges. Residents and visitors desire this clear division that has been lost in so many American cities through strip commercial development and sprawling residential subdivisions. Protecting and enhancing the visual character of our community gateways, the undeveloped hillsides, and night skies is a priority (page 9).

Environmental Quality and Scenic Beauty: Ketchum's citizens place great value on the exceptional natural setting and resources of the Wood River Valley. The community is surrounded by rugged alpine peaks, forested and sage-covered open spaces, pristine wildlife habitat, and beautiful rivers and riparian areas. Key open spaces create visual buffers between the built and natural environment. Unobstructed views exist in every direction in large part due to Ketchum's wide streets and lack of hillside development. These environmental features and resources sustain our economy and are why many people choose to live in Ketchum. We will be excellent stewards of these resources in order to preserve them for the future (page 10).

The comprehensive plan sets policies to guide land-use decisions and identifies the following objectives regarding hillside development:

- Policy OS-3.2: Establish and maintain open space buffers in important scenic areas to maintain the community's separate identity from surrounding communities and to protect views and open space.
- Goal CD-2: Protect and enhance views of the surrounding mountains and natural features.
- Policy CD-2.2: Continue to protect hillsides within the City and the Area of City Impact from further development. Enforce and encourage strengthening of the Mountain Overlay standards of the City and County, by using a variety of techniques; such as clustering at lower elevations, creating conservation easements, or purchasing private property on hillsides.
- Policy CD-2.4: Protect and incorporate natural features into newly developing areas. Conserve the natural patterns of streams, ridgelines, topography, riparian areas, and wildlife habitat areas.

The MOD ensures the preservation of Ketchum's surrounding hillsides and ridgelines and minimizes impacts on natural topography, geology, soils, drainage, wildlife, and native vegetation. The Mountain Overlay Design Review standards reduce visual impact by directing building sites away from higher elevations and keeping hillsides open and unobstructed. Additionally, MOD standards protect public health, safety, and welfare by ensuring the adequate provision of emergency services, fire protection, and utilities.

The comprehensive plan's future land use map identifies two different future land use designations for the property, the lower and upper portions of the property. The map designates the future land use for the downhill portion of the subject property as low-density residential. Desired primary uses within this future land use category include single-family and duplex residences as well as accessory units. The proposed single-family residence falls within the primary uses of the low-density residential land use category. Open space is identified as an appropriate secondary use that complements the low-density residential units. The uphill portion of the subject property is designated as open space, parks & recreation which does not encourage any development in that area of the property.

As previously mentioned, Policy CD-2.2 of the plan indicates that new development should be clustered at lower elevations to protect hillsides within the City. The proposed residence is sited at the lower elevation within the low-density designation portion of the parcel and has a front yard setback of 15'-2 ½" which is just slightly above the minimum required front yard setback of 15' to cause minimal impact on the visual character of the hillside. The proposal is also sited lower than many of the existing developments along Sage Road.

Staff believes that the goals and policies of the comprehensive plan related to hillside development are met with the proposed project as the single-family residence is within the list of primary uses anticipated in the future land use category and due to the location of the structure, the visual character of the hillside is not impacted.

Criteria #2: Applicable Standards and Criteria

Conformance with Design Review Improvements and Standards

As the project is located in the MOD, the project is subject to both Mountain Overlay criteria outlined in 17.104.070 as well as Design Review criteria outlined in 17.96.060. During department review, city staff reviewed the project for conformance with all design review standards and required improvements specified in KMC §17.96.060. Additionally, staff reviewed the project for conformance with all city code requirements for right-of-way improvements, utilities, and drainage. Staff believes the project meets the design review standards. Please see Attachment E for staff's comprehensive design review standards analysis. Below is an overview of some of the more noteworthy design review criteria for the proposed project.

Compatibility of Design (KMC 17.96.060.E) and Architectural Features (KMC 17.96.060.F)

Pursuant to KMC §17.96.060.E.1, "The project's materials, colors and signing shall be complementary with the townscape, surrounding neighborhoods and adjoining structures." Sage Road features residences built at varying timeframes resulting in a diverse range of materials and architectural styles. This has resulted in mountain modern architectural styles (flat roofs, high percentage of glazing, and cold materials such as concrete and metal) mixed with older traditional styles (pitched roofs and warm materials such as wood and stone). The adjacent structure to the lookers right recently received Design Review approval on June 27, 2023 (File No. P22-070) to demolish the existing three-story traditional log cabin style attached townhouse development with a modern style flat roof and high glazing detached townhomes. The structure to the lookers left is also a three-story townhouse with a more traditional design that utilizes shed roofs and wood materials. The architectural style of the proposed residence is three stories in height and features a modern design with shed roofs, large windows, and a mix of wood, steel, and stone siding. Additionally, per KMC §17.96.060.F.2 & 5, "The building character shall be clearly defined by the use of architectural features" and "Buildings walls shall provide undulation/relief, thus reducing the appearance of bulk and flatness." Each floor of the proposed residence is stepped back into the hillside, providing undulation and relief. Additionally, the proposal features multiple wall and deck pop-outs to reduce the appearance of flatness.

Conformance with Mountain Overlay Standards

Please see Attachment F for staff's comprehensive Mountain Overlay Design Review standards analysis. In general, staff believes the Mountain Overlay Design Review criteria outlined in KMC §17.104.060 is met. However, staff has concerns with the application's compliance with Criteria #10 which states, "Are there other sites on the parcel more suitable for the proposed development in

order to carry out the purposes of this section." Criteria #10 was further defined by Zoning Code Interpretation 22-001 (Attachment I) regarding the redevelopment of nonconforming properties in the MOD and development into 25% slopes.

The Commission determined that existing nonconforming properties may be redeveloped under the following conditions:

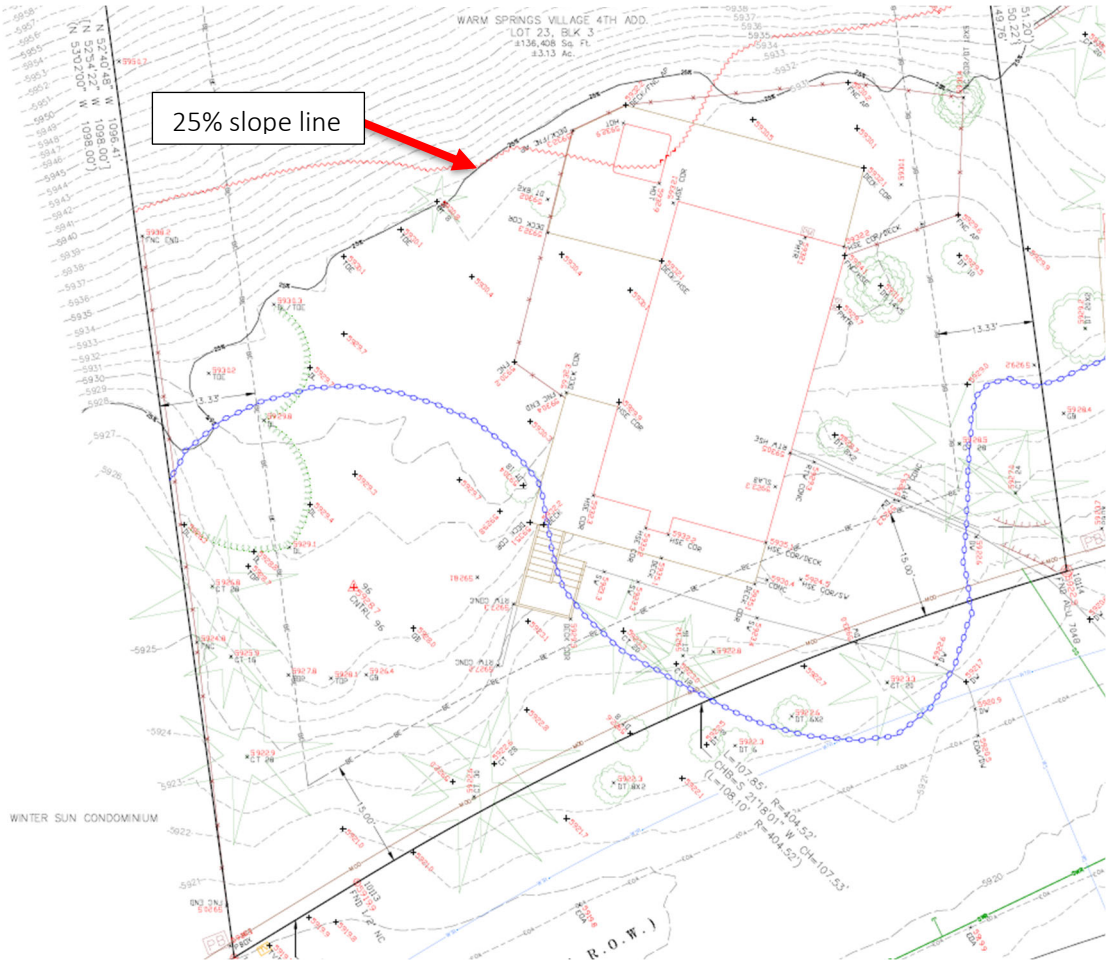
A. If the property configuration is proposed to be modified (lot line adjustment, lot consolidation etc.), then the new property configuration must establish a building envelope on the lowest portion of the property. Existing non-conforming building footprints are not permitted to be redeveloped outright. If a more compliant alternative at a lower elevation on the hillside property exists, then the new home must be sited in a more suitable area for redevelopment.

B. If the property configuration is not being altered or changed, then a new home may be constructed at the Commission's discretion through Mountain Overlay Design Review provided that the project does not exceed the height or limits of disturbance of the existing nonconforming home. The building footprint shall conform as close as possible to the existing building.

As noted in the executive summary, the applicant is proposing to demolish the existing single-family residence and retain the existing configuration of the property. Therefore, subsection B of the interpretation above is applicable to the project. This requires the project to demonstrate that the project does not exceed the height or limits of disturbance of the existing nonconforming home. Staff believes that to comply with criteria #10, more compliant and suitable locations for development are those outside of 25% or greater slopes, particularly when a site is previously disturbed.

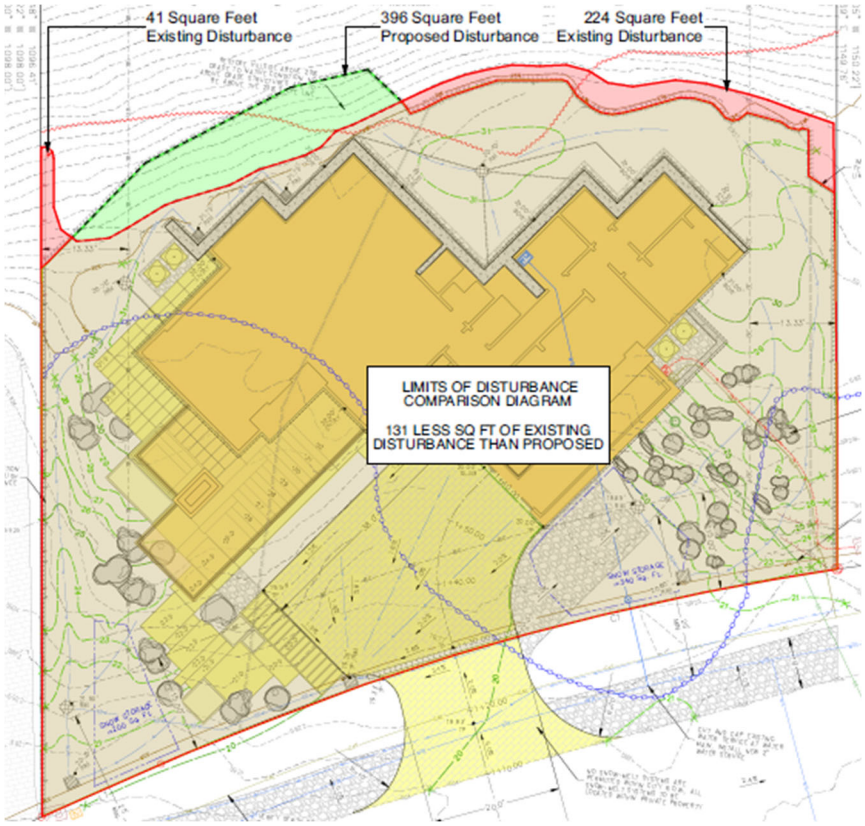
Currently, the existing nonconforming single-family residence on the property is located outside of the 25% slope. However, due to the grading lines on the site survey (Figure 3), it appears that the entire lot was previously within 25% slope and was graded for the construction of the existing structure on the lot.

Figure 3: Site Survey



The proposed development differs by increasing the disturbance into the 25% slope area of the lot. No portion of the proposed residence will encroach into the 25% slope area. However, 396 square feet of disturbance into the hillside is proposed for the structure's construction. This proposed disturbance is not reflected in the current plan set, as staff had brought it to the applicant's attention that the existing limits of disturbance diagram on Sheet A200C of Attachment B had not accurately reflected the site survey. The applicant informed staff that an outdated site survey had been used and sent staff a revised Sheet A200C which increased the proposed limits of disturbance from 254 square feet to 396 square feet. The accurate proposed limits of disturbance is reflected in Figure 4 below. The MOD does encourage development to be sited down on the hillside, which the proposed residence does by having just slightly above the minimum required front yard setback. However, as the development uses more of the western portion of the lot, the development does see encroachment into the 25% slope area.

Figure 4: Proposed Encroachment into 25% Slope (green)



In previous Mountain Overlay applications, the Commission has been supportive of minor encroachments into the 25% slope area for permanent structures. The project is proposing temporary encroachment into the 25% slope during construction, which would be reclaimed following completion of the project. Therefore, staff is supportive of the proposed temporary encroachment into the 25% slope area.

Conformance with Zoning Regulations

During city department review, planning staff reviewed the project for conformance with all applicable zoning code requirements including permitted uses, dimensional limitations, parking, development standards, and dark skies. Staff believes the project complies with all zoning code regulations and dimensional standards required in the GR-L Zone. Comprehensive analysis of the project's conformance with zoning code requirements and dimensional standards is provided in Attachment G.

IV. CONFORMANCE WITH CONDITIONAL USE PERMIT STANDARDS

The Sage Road neighborhood is within the blue and red avalanche zones. New buildings within the Avalanche Zone District must meet the standards and comply with certain restrictions specified in KMC §17.92.010. New construction in the Avalanche Zone must be certified by an engineer licensed in the State of Idaho certifying that the proposed construction, as designed, will withstand the avalanche forces specific to the development site (KMC §17.92.010.D.3). Avalanche structures or earthwork that threaten to deflect avalanches toward the property of others or otherwise threaten to increase the danger to persons or property are prohibited (KMC §17.92.010.D.2). Avalanche attenuation and protective structures require the review and approval of a Conditional Use Permit. Staff believes the project complies with the Conditional Use Permit criteria outlined in KMC §17.116.030. Please see

Attachment H for staff's comprehensive Conditional Use Permit standards analysis. Below is an overview of some of the more noteworthy criteria for the project.

Criteria A of the Conditional Use Permit standards requires that the characteristics of the conditional use are compatible with the types of uses permitted in the applicable zoning district. The project is proposing an avalanche retaining wall on the rear of the residence. The function of the avalanche wall is to protect the proposed structure, adjacent structures, and to prevent snow from sliding onto the Sage Road right-of-way. Staff finds the proposed avalanche protective structure for the project to be compatible with the other proposed uses in the zoning district, as other avalanche protective structures have been permitted on Sage Road and in the surrounding neighborhood.

Criteria B of the Conditional Use Permit standards stipulates that the conditional use will not materially endanger the health, safety and welfare of the community. As previously mentioned, the function of the avalanche wall is to protect the proposed structure, adjacent structures, and to prevent snow from sliding onto the Sage Road right-of-way. The applicant submitted a site-specific avalanche study and avalanche wall plans designed by a structural engineer to withstand the anticipated forces. The wall's exposed height is 24' above grade and it is located perpendicular to the projected avalanche flow to not deflect avalanches onto adjacent properties or damage/endanger persons or property in the vicinity of the project. Upon review of the submitted material, staff believes the proposed avalanche wall meets Conditional Use Permit criteria B.

STAFF RECOMMENDATION

Staff recommends **approval** of the Design Review application (File No. P23-009) subject to the following conditions:

1. This Design Review approval is based on the project plans presented at the July 11, 2023, Planning and Zoning Commission meeting. The project plans for all on-site improvements submitted for the building permit must conform to the approved design review plans unless otherwise approved in writing by the Planning and Zoning Commission or Administrator. Any building or site discrepancies which do not conform to the approved plans will be subject to review by the Commission and/or removal.
2. The applicant shall submit final civil drawings prepared by an engineer registered in the State of Idaho which include specifications for right-of-way, circulation design, utilities, and drainage improvements for review and approval by the City Engineer, Streets, and Utilities departments prior to issuance of a building permit for the project.
3. The term of Design Review approval shall be twelve (12) months from the date that the Findings of Fact, Conclusions of Law, and Decision are adopted by the Commission or upon appeal, the date the approval is granted by the Council subject to changes in zoning regulations.
4. In addition to the requirements set forth in this Design Review approval, this project shall comply with all applicable local, state, and federal laws.

Staff recommends **approval** of the Conditional Use Permit application (File No. P23-009A) subject to the following conditions:

1. This conditional use permit approval is based on the project plans presented at the July 11, 2023, Planning and Zoning Commission meeting. Building Permit Plans must conform to the approved plans unless otherwise approved in writing by the Commission or the Planning and

Zoning Administrator. Any building or site discrepancies which do not conform to the approved plans will be subject to removal.

2. This Conditional Use Permit is not transferable from one parcel of land to another.
3. The conditional use permit is subject to all conditions of approval associated with Design Review approval P23-009.
4. The term of this Conditional Use Permit shall be that of Design Review approval P23-009. In the event the Design Review approval expires, this Conditional Use Permit approval shall also expire and become null and void.

V. RECOMMENDED MOTIONS

Design Review:
"I move to approve the 406 Sage Road Mountain Overlay Design Review application, as conditioned, and direct staff to return with the findings of fact."

Conditional Use Permit:
"I move to approve the 406 Sage Road Conditional Use Permit application, as conditioned, and direct staff to return with the findings of fact."

ATTACHMENTS:

A. Mountain Overlay Design Review - Application and Supplemental Documents
B. Mountain Overlay Design Review Plan Set
C. Conditional Use Permit – Application Materials and Supplemental Documents
D. Conditional Use Permit Plan Set
E. Design Review Standards Analysis
F. Mountain Overlay Design Review Standards Analysis
G. Zoning and Dimensional Standards Analysis
H. Conditional Use Permit Standards Analysis
I. Planning and Zoning Commission Zoning Code Interpretation 22-001
J. Public Comment

City of Ketchum

Attachment A:

Mountain Overlay Design Review – Application Materials and Supplemental Documents

City of Ketchum
Planning & Building

OFFICIAL USE ONLY	
File Number:	P23-009
Date Received:	2/16/23
By:	HLN
Fee Paid:	$1400
Approved Date:	
Denied Date:	
By:	

Mountain Overlay Design Review Application

OWNER INFORMATION			
Project Name: Pratt Residence			
Owner Name: Bradley & Gail Pratt			
Mailing Address: 2232 78th Ave. NE, Medina, WA 98039			
Phone: (425) 269-4000			
Email: bradpratt@outlook.com			
PROJECT INFORMATION			
Architect/Representative: Farmer Payne Architects - Nathan Hecker			
Phone: (208) 214-5155			
Mailing Address: 351 N. Leadville Ave., Unit 204, Ketchum, ID 83340			
Email: nate@farmerpaynearchitects.com			
Engineer of Record: Alex Nelson, PE - Alpine Enterprises Inc.			
Engineer Email: alexnelson@alpineenterprisesinc.com			
Legal Land Description: Warm Springs Village Subdivision, 4th Addition, Block 3, Lot 23			
Project Address: 406 Sage Road			
Lot Area: 136,408 Sq. Ft. - 3.13 Ac.			
Zoning District: General Residential Low-Density (GR-L)			
Anticipated Use: Single-Family Residential			
Number of Residential Units: 1			
TYPE OF CONSTRUCTION			
☑ New	☐ Remodel	☐ Addition	☐ Other, please explain:

TOTAL FLOOR AREA			
Proposed		Existing	
Basement: N/A			
1st Floor: 1,648 Sq. Ft.			
2nd Floor: 2,320 Sq. Ft.			
3rd Floor: 2,126 Sq. Ft.			
Decks: 601 Sq. Ft.			
Mezzanine: N/A			
Total: 6,695 Sq. Ft.			
Building Coverage: 3,634 Sq. Ft. 2.66 %		Curb Cut: NA SF % See ROW Application	
PROPOSED SETBACKS			
Front: 15.00'	Side: 13.33'	Side: 13.33'	Rear: 15.00'
ADDITIONAL INFORMATION			
Building Height: 40'-0"		Parking Spaces Provided: 2 Car Garage + 2 On-Site	
Will Fill or Excavation Be Required? (Yes) No			
If Yes, Amount in Cubic Yards Fill: 83.7 CY Excavation: 2057.7 CY			
Will Existing Trees or Vegetation Be Removed? (Yes) No			

Applicant agrees in the event of a dispute concerning the interpretation or enforcement of the Mountain Overlay Design Review Application, in which the City of Ketchum is the prevailing party, to pay reasonable attorney fees, including attorney fees on appeal, and expenses of the City of Ketchum. I, the undersigned, certify that all information submitted with and upon this application form is true and accurate to the best of my knowledge and belief.

Bruce Smith — 31JAN23

Representative's Signature — Bruce Smith, PLS 7048, Alpine Enterprises Inc. — Date

Once your application has been received, we will review it and contact you with next steps. No further action is required at this time.

406 Sage Road

Mountain Overlay Design Review Narrative Response

This project is situated on a relatively flat bench of land situated between grades of 25% or greater to the front and back, making it the only plausible area for construction and minimizing disturbance to the existing site that's within the lot's building envelope. The proposed design utilizes a three-story tall split-level design to minimize development in the steep slope at the front of the property and provide bedrooms and living spaces access to the natural lighting, ventilation, and means of egress required by code, similar to the design of the neighboring townhomes. The existing adjacent townhomes provide insight into the material visual impact the proposed design would have and would not create a significant impact on the skyline visible from public vantage points entering the City or within the City, or even upon entering Sage road (1). Similarly, all building, excavating, filling and vegetation disturbance on hillsides would not have a material visual impact visible from a public vantage point entering the City or within the City (2).

As seen on the civil and landscape plans, the driveway and other applicable standards contained in title 12, chapter 12.04 of the code are met (3). The Landscape Site Plan L-1.0 depicts the access for fire and other emergency vehicles to within 150 feet of the furthest exterior wall of the building (4), and when used in conjunction with the existing site survey, it shows that no rock outcroppings will be disturbed (5). IBC, IFC & Ketchum Fire Department requirements, also noted on the General Notes & Drawing Index sheet A102, will be met (6). Public water and sewage service shall comply with the requirements of the City & drainage will be controlled and maintained to not adversely after other properties as depicted and noted on the landscape and civil drawings (7 & 8). Cuts, fills & lengths of allowed driveways will be minimized, and the required cuts and fills will be concealed with landscaping, revegetation and/or natural stone materials. Hillsides with a clear zone of 30 feet around the structure will be revegetated and will include low combustible, drought-tolerant species, appropriate to the Ketchum Planning Department.Revegetation outside of the clear zone will be harmonious with the surrounding hillsides (9).

As aforementioned, the proposed building location on this parcel is the most suitable to carry out the purposes of the City's Mountain Overlay design review standards (10). There is not proposed access that traverses 25% or greater slopes in the design (11). The utilities, shown on the civil drawings, will be underground (12). The limits of disturbance, established on sheets C1.0 A200C, will be protected by onsite fencing for the duration of construction (13). Excavations, fills & vegetation disturbance on the hillsides not associated with construction will be minimized (14). The relevant significant landmark of this lot is the Stairmaster hillside and will be protected and preserved where applicable (15). Where below grade structures encroach into setback, they won't conflict with any applicable easements, existing underground structures, sensitive ecological areas, soil stability, drainage, or other sections of the City of Ketchum Code of Ordinances, adopted ICC codes, or other site features concerning health, safety, and welfare (16).

1. There shall be no building on ridges or knolls which would have a material visual impact on a significant skyline visible from a public vantage point entering the City or within the City. "Material", as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this section;

2. Building, excavating, filling and vegetation disturbance on hillsides which would have a material visual impact visible from a public vantage point entering the City or within the City shall be minimized. "Material", as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this section;

3. Driveway standards as well as other applicable standards contained in title 12, chapter 12.04 of this Code shall be met;

4. All development shall have access for fire and other emergency vehicles to within 150 feet of the furthest exterior wall of any building;

5. Significant rock outcroppings shall not be disturbed;

6. International Building Code (IBC) and International Fire Code (IFC) and Ketchum Fire Department requirements shall be met;

7. Public water and sewer service shall comply with the requirements of the City;

8. Drainage shall be controlled and maintained to not adversely affect other properties;

9. Cuts and fills allowed for roadways shall be minimized; lengths of driveways allowed shall be minimized; all cuts and fills shall be concealed with landscaping, revegetation and/or natural stone materials. Revegetation on hillsides with a clear zone of 30 feet around all structures is recommended. Said clear zone shall include low combustible irrigated vegetation with appropriate species, on file with the Ketchum Planning Department. Revegetation outside of this clear zone should be harmonious with the surrounding hillsides;

10. Are there other sites on the parcel more suitable for the proposed development in order to carry out the purposes of this section;

11. Access traversing 25 percent or greater slopes does not have significant impact on drainage, snow and earthslide potential and erosion as it relates to the subject property and to adjacent properties;

12. Utilities shall be underground;

13. Limits of disturbance shall be established on the plans and protected by fencing on the site for the duration of construction;

14. Excavations, fills and vegetation disturbance on hillsides not associated with the building construction shall be minimized; and

15. Preservation of significant landmarks shall be encouraged and protected, where applicable. A significant landmark is one which gives historical and/or cultural importance to the neighborhood and/or community.

16. Encroachments of below grade structures into required setbacks are subject to subsection 17.128.020.K of this title and shall not conflict with any applicable easements, existing underground structures, sensitive ecological areas, soil stability, drainage, other sections of this Code or other regulating codes such as adopted International Code Council Codes, or other site features concerning health, safety, and welfare.

FARMERPAYNE | ARCHITECTS

SUN VALLEY | JACKSON HOLE | LOUISIANA
WWW.FARMERPAYNEARCHITECTS.COM

SUN VALLEY STUDIO
351 N LEADVILLE AVE
SUITE 204
KETCHUM, ID 83340

Pratt Residence
406 Sage Road, Ketchum,ID.83340

Proposed Design

- Total Habitable: 4,784 SF / Gross: 6,095 SF
- 406 Sage Road is a narrow and deep site with a natural building pad located at the bottom of a steep slope.
- The first floor is at street level and it steps up to a naturally existing building pad one floor up.
- The proposed lower level only houses the garage and mudroom at street level which allows for a very level driveway for Fire Access, for the volume further from the street, the 2nd level floor system is “Slab on Grade” which significantly reduces excavation to the existing topography.
- The massing steps back from the street for the upper two floors, with the public space located on the top floor.
- The Design uses regional materials with earthy tones and is in character with adjacent properties, utilizing natural stone, wood, steel, and glass. *See Material Board for images.*
- To take advantage of the natural unique flat buildable area, our design is pushed as close to the street as possible. *Please refer to the site diagrams showing how close the building is to the street.*
- Per multiple meetings over the last year with P&Z, numerous design changes have been implemented to better comply with the city’s requirements and requests and we all think that the proposed design has benefitted from these meetings.
    - Per the most recent meeting, the entire structure now sits outside of the 25% slope.
    - We anticipate minimal disturbance to the natural hillside during the construction process (.5% of total area of site above 25% slope). The disturbed area will be regraded and planted to restore original site conditions. *Please refer to the Hillside and Plant Community Restoration Plan located on the next page.*

Existing Structure & Disturbance

- The whole building pad was artificially manipulated for the existing structure and landscaping. Planting of Trees, Informal Drive, Lawn, Decks, Retaining Walls, etc.
- The existing structure is not designed to withstand the avalanche forces prevalent on site.
- Little to no maintenance has been done on the existing house and over the last 50 years it has deteriorated significantly.

GARDEN SPACE DESIGN
Dean Hernandez & Denise Jackson Ford

Hillside and Plant Community Restoration Plan

RESTORATION NEED: Landscape restoration following construction will be necessary including within some of the 25% slope areas of the site (.5% of total area above 25% Slope). Because safe and effective construction of avalanche walls and footings is substantial enough to require cutting back into the site hillside, some slope areas, including those of 25%, will need to be disturbed during excavation and construction for room to build avalanche protection features. The plan is to restore all slope areas on the north side of the proposed Pratt home to pre-existing slope and plant conditions.

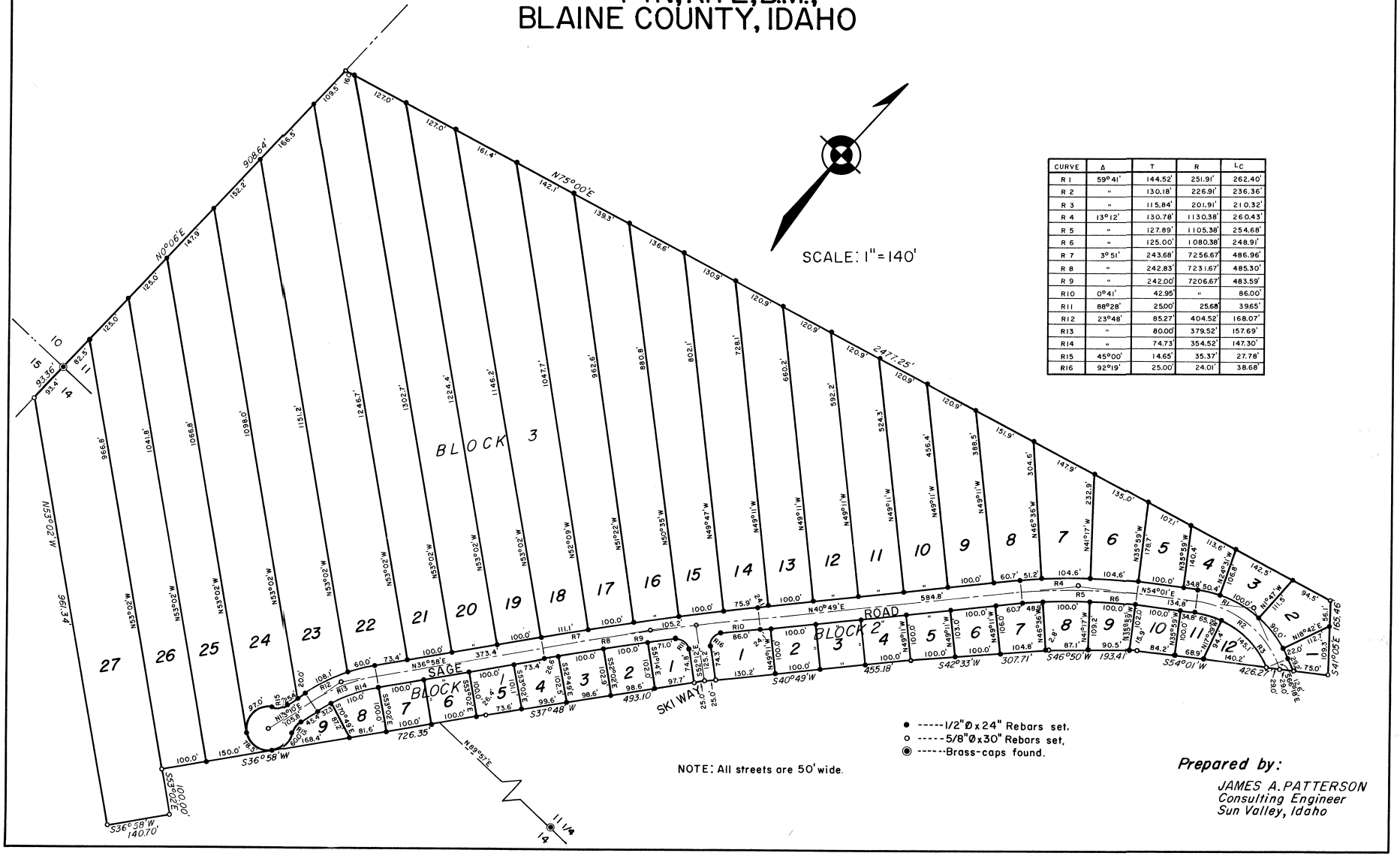
GRADING OPPORTUNITY: To regain the natural configuration and contours of the site, the hillside will be regraded, after walls are completed, using the original percent slopes, and allowing the fill material to flow back against the avalanche-rated walls all along the north side of the house. These sturdy avalanche walls will allow for all areas of the hillside, including the small amount disturbed within the 25% slope area, to be restored back to the current, natural state. Backfill materials against the avalanche walls must be well-draining and non-compactable gravels. Structural backfill will be top-dressed with approximately 18" of amended soils mixed with soils initially collected from the surface of the hillside.

PLANT COMMUNITY RESTORATION: The combination of preserved site soils mixed with amended soils will support vigorous root growth for native grass and perennial plant plugs. It will also salvage and provide germination for seed already existing in site soils as well as promote germination for the Sage Country seed mixes that will be overseeded. Native Grass Plugs grown from the Sage Grass Mix and Native Perennial Plugs for shrub growth will be planted at 18" on-center in addition to broadcast seeding. The combination of existing site seed, grass/perennial plugs and overseeding with Sage Country mixes is intended to supplement native plant diversity and density while out-competing invasive plant species. Western Native Seed is the recommended source company for restorative native seed and plant plugs. Sage Country 'Short Grass Mix', 'Grass Mix', and 'Wildflower Mix' provide the recommended restoration seed "recipes" for the site in terms of its plant Zones 3 and 4, its xeric climate and its 5,000+ elevation. Following snow melt and as existing site vegetation begins to grow, we plan to survey and catalogue plant species naturally thriving on site. The aim is to fine-tune the recommended seed mix "recipes" to best match the existing plant community.

WATER CONSERVATION: A temporary irrigation system using water-conserving, oscillating rotators will be installed to operate during hillside plant community restoration. Temporary irrigation for establishing native plants typically entails two growing seasons. Throughout the time required to restore the hillside native plant community, the site will be in compliance with Idaho State irrigation restrictions. The areas of irrigation needed temporarily to germinate seed and to establish root systems for grass and perennial plugs is estimated to be 1,730 square feet. The areas to be irrigated permanently using water-conserving drip systems and oscillating rotators are estimated to be 4,177 square feet. The combined temporary and permanent areas of water-conserving drip and oscillating rotator irrigation systems total only 0.13 acres. This combined area of water use is far less than the maximum 0.50 or half acre allowed by Idaho State code.

WARM SPRINGS VILLAGE SUBDIVISION, FOURTH ADDITION

IN THE SW1/4, SEC. 11 & LOT 4, SEC. 14, T4N, R17E, B.M., BLAINE COUNTY, IDAHO



CURVE	Δ	T	R	Lc
R 1	59°41'	144.52'	251.91'	262.40'
R 2	"	130.18'	226.91'	236.36'
R 3	"	115.84'	201.91'	210.32'
R 4	13°12'	130.78'	1130.38'	260.43'
R 5	"	127.89'	1105.38'	254.68'
R 6	"	125.00'	1080.38'	248.91'
R 7	3°51'	243.68'	7256.67'	486.96'
R 8	"	242.83'	7231.67'	485.30'
R 9	"	242.00'	7206.67'	483.59'
R10	0°41'	42.95'	"	86.00'
R11	88°28'	25.00'	25.68'	39.65'
R12	23°48'	85.27'	404.52'	168.07'
R13	"	80.00'	379.52'	157.69'
R14	"	74.73'	354.52'	147.30'
R15	45°00'	14.65'	35.37'	27.78'
R16	92°19'	25.00'	24.01'	38.68'

NOTE: All streets are 50' wide.

Prepared by:
JAMES A. PATTERSON
Consulting Engineer
Sun Valley, Idaho

OWNER'S CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS that Mark B. Lloyd and Helen R. Lloyd, husband and wife, are the owners of a certain parcel of land as shown on this plat described to-wit:

A parcel of land within the SW 1/4, Sec.11 and Lot 4, Sec.14, T4N, R17E, B.M., Blaine County, Idaho, and more particularly described by metes and bounds as follows: Commencing at a brass-cap marking the NW Cor. of said Sec.14, T4N, R17E, B.M. and said brass-cap being the true point of beginning. Thence N0°06'E, 908.6 feet along the west boundary of said Sec.11; thence N75°00'E, 2477.2 feet; thence S41°05'E, 165.5 feet to the northwesterly boundary of Warm Springs Village Subdivision; thence S54°01'W, 426.3 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S46°50'W, 193.5 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S42°33'W, 307.7 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S40°49'W, 455.2 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S37°48'W, 493.1 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S36°58'W, 726.4 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence S53°02'E, 100.0 feet along the southwesterly boundary of Warm Springs Village Subdivision; thence S36°58'W, 140.7 feet along the northwesterly boundary of Warm Springs Village Subdivision; thence N53°02'W, 961.3 feet to the west boundary of said Sec.14; thence N0°06'E, 93.4 feet along the west boundary of said Sec.14 to a brass-cap, said brass-cap being the true point of beginning, and said parcel containing 55.68 acres more or less.

The owners do hereby dedicate to the use of the public forever, all streets as shown on this plat.

IN WITNESS WHEREOF, We have hereunto set our hands this 29 day of June, 1961.

Mark B. Lloyd
Mark B. Lloyd

Helen R. Lloyd
Helen R. Lloyd

ACKNOWLEDGEMENT

STATE OF IDAHO)
COUNTY OF BLAINE) ss

On this 29 day of June, 1961, before me, the undersigned, a notary public in and for the said State and County, personally appeared Mark B. Lloyd and Helen R. Lloyd, husband and wife, known to me to be the persons whose names are subscribed to the above instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have set my hand and seal the day and year in this certificate first above written.

My commission expires My Commission Expires Jan. 26, 1964.

Notary Public in and for Idaho

SEAL

ENGINEER'S CERTIFICATE

I, James A. Patterson, a duly registered professional engineer in the State of Idaho do hereby certify that this plat of WARM SPRINGS VILLAGE SUBDIVISION, FOURTH ADDITION is a true and accurate map of the land surveyed under my direct supervision; that the location of blocks, lots and streets have definately been established and perpetuated in strict accordance with the State of Idaho Code relating to plats and surveys and that they are, as shown hereon a portion of the SW 1/4, of Sec.11 and Lot 4 of Sec.14 as described in the owner's certificate.

REGISTERED PROFESSIONAL ENGINEER 1183 6/29/61 STATE OF IDAHO JAMES A. PATTERSON

James A. Patterson
Registered Professional Engineer
Idaho Certificate No. 1183

COUNTY SURVEYOR'S CERTIFICATE

This is to certify that I, _____, County Surveyor for Blaine County, have checked the forgoing plat and computations for making the same and have determined that they comply with the laws of the State of Idaho thereto.

Date: _____

_____
County Surveyor
Idaho Certificate No. ____

BOARD OF COUNTY COMMISSIONER'S APPROVAL

The forgoing plat of WARM SPRINGS VILLAGE SUBDIVISION, FOURTH ADDITION was approved and accepted this 12 day of June, 1961 by the board of County Commissioners of Blaine County, Idaho.

By: Ray Sweet
Chairman

COUNTY RECORDER'S CERTIFICATE

I hereby certify that this instrument was filed for record at the request of James Patterson at 30 minutes past 3:00 o'clock P. M., this 13 day of June, 1961 A.D., in my office, and duly recorded in Book 4 of Plats at page 9.
Instrument No. 115701

Fee: $5.00 Paid

George L. McCoy
County Recorder

City of Ketchum

Attachment B:

Mountain Overlay Design Review – Plan Set

FARMERPAYNE
ARCHITECTS

Jackson Hole
260 West Broadway, Suite A
Jackson, WY 83001
T.307.264.0080

Sun Valley
351 N Leadville, Suite 204
Ketchum, ID 83340
T.208.214.5155

Louisiana
910 Pierremont Rd, Suite 410
Shreveport, LA 71106
T.318.383.3100

ARCHITECT STAMP

LICENSED
ARCHITECT
AR 986479
5/4/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM
ID 83340

DATE:	5/4/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:

Design Review	3.31.23
Design Review Response	

A101
COVER SHEET

vs

PRATT RESIDENCE

406 Sage Rd, Ketchum, ID 83340

PROJECT DIRECTORY

Architect: **Farmer Payne Architects**
Nate Hecker Architect, Project Manager, AIA
Aaron Belzer Architect, Associate, AIA
Scott Payne Principal, AIA, LEED AP
351 N Leadville Avenue, Suite 204
Ketchum, ID 83340
t: 208.214.5155
e: nate@farmerpaynearchitects.com
aaron@farmerpaynearchitects.com
scott@farmerpaynearchitects.com

Contractor: **Poster Construction**
Riley Sibbach Superintendent
Richard Brownson Project Manager
Brian Poster President, Owner
120 Second Avenue, North, Suite 105
Ketchum, ID 83340
t: 208.726.7676
e: riley@poster-construction.com
richard@poster-construction.com
brian@poster-construction.com

Interior Designer: **Jennifer Hoey Interior Design**
Madison King Designer
Jennifer Hoey Founder, ASID, NCIDQ
300 North Main Street, Suite 202
Ketchum, ID 83340
t: 208.726.1561
e: madison@jenniferhoey.com
jennifer@jenniferhoey.com

Structural Engineer **Maxwell Structural Design Studio**
Jack Swanson EIT
Craig Maxwell Founder, PE
105 Lewis Street, Suite 205
Ketchum, ID 83340
t: 208.721.2171
e: jack@maxwellsds.com
craig@maxwellsds.com

Landscape Architect **Gardenspace Design**
Denise Ford Landscape Architect
Dean Hernandez Founder
101 East Bullion Street, Studio 2J
Hailey, ID 83333
t: 208.721.0987 / 208.720.7210
e: denise@gardenspacedesigns.com
dean@gardenspacedesigns.com

Civil Engineer / Avalanche Consultant **Alpine Enterprises**
Bruce Smith Land Surveyor
Alex Nelson Civil Engineer & Surveyor, PE
660 Bell Drive, Unit 1
Ketchum, ID 83340
t: 208.727.1988
e: bsmith@alpineenterprisesinc.com
alexnelson@alpineenterprisesinc.com

CODE ANALYSIS

2018 International Residential Code
2018 IFC
2018 IECC
City of Ketchum Building & Fire Ordinances

Occupancy	Residential
Construction Type	Type V-B
Number of Stories	3
Building Height	39'-6"
Zoning:	GR-L / Avalanche
Deferred Submittal	Signage Package Fire Detection Design Fire Sprinkler Alarm Design Fire Sprinkler Design

SQUARE FOOTAGE TABULATIONS

Lower Level Habitable	406 sf
Main Level Habitable	2,178 sf
Upper Level Habitable	2,044 sf
TOTAL HABITABLE	**4,628 sf**
Mechanical	162 sf
Garage (Carport)	1,149 sf
TOTAL NON-HABITABLE	**1,311 sf**
GROSS SQUARE FOOTAGE	**5,939 sf**

BLDG COVERAGE TABULATIONS

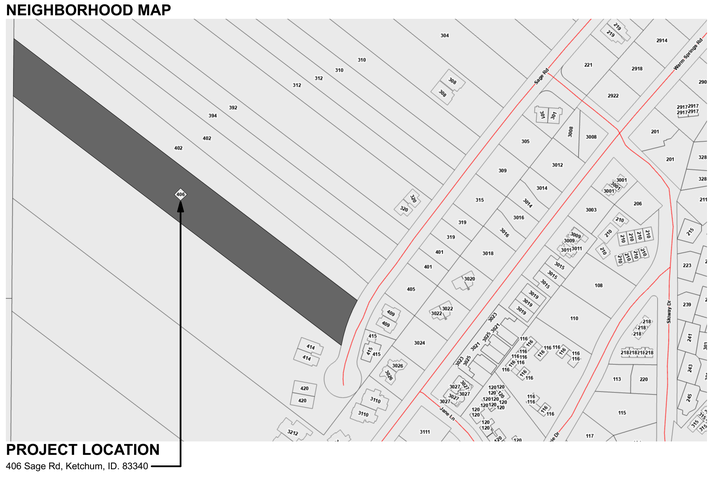
LOT SIZE	136,408 sf
ALLOWABLE PER ZONING CODE:	35% (47,743sf)
PROPOSED COVERAGE:	**2.7% (3,692 sf)**

SETBACKS

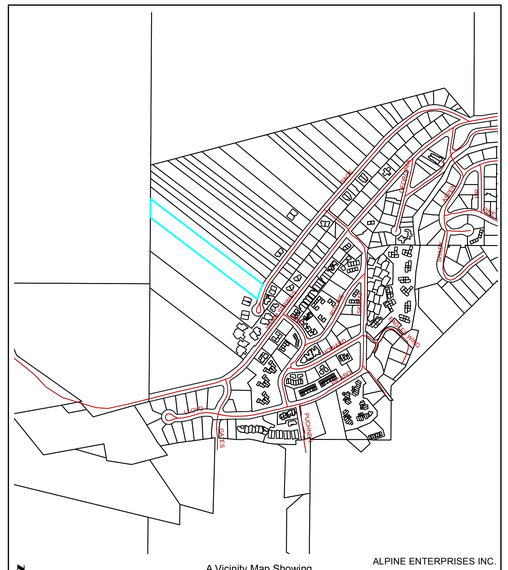
	REQUIRED:	PROPOSED:
Front:	15'-0"	15'-2 1/2"
Side:	13'-4" (Based on 40' Bldg Ht)	13'-4 3/4" South Side
Side:	13'-4" (Based on 40' Bldg Ht)	13'-6 3/4" North Side
Rear:	15'-0"	1,034'

DRAWING INDEX

NEIGHBORHOOD MAP



PROJECT LOCATION
406 Sage Rd, Ketchum, ID. 83340



A Vicinity Map Showing
Lot 23, Block 3
Warm Springs Village Subdivision, 4th Addition
Ketchum, Idaho

1 inch = 500 feet

ALPINE ENTERPRISES INC.
PO Box 2037
660 Bell Drive, Unit1
Ketchum, Idaho
208-727-1988
January 2023

GENERAL NOTES

01. The structural, mechanical and electrical drawings are supplementary to the architectural drawings. It shall be the responsibility of the contractor to check with the architectural drawings before the installation of structural, mechanical, electrical, and plumbing work. Any discrepancy between the architectural drawings and the consulting engineers drawings, shall be brought to the architects attention for clarification prior to installation of said work. Any work installed in conflict with the architectural drawings shall be corrected by the contractor at his expense and at no additional expense to the owner or architect.

02. Contractor shall verify all conditions and dimensions at job site prior to bidding and start of construction. If discrepancies are found, the architect shall be noted for clarification before commencing work.

03. All symbols and abbreviations used on the drawings are considered to be construction standards. If the contractor has questions regarding some, or their exact meaning, the architect shall be notified for clarification.

04. All work shall conform to the requirements of the most current edition of the International Residential Code. The most current adopted version NFPA 101 Life Safety Code, National Electric Code, The Uniform Plumbing Code, The Uniform Mechanical Code, and all other governing authorities having jurisdiction.

05. Contractor shall submit shop drawings for windows, doors, millwork, cabinetry, structural steel, trusses, etc. Contractor shall submit samples for all finishes. All submittals shall be approved be architect before installed.

06. All dimensions are to face of concrete, face of column or center line, face of concrete block walls and face of studs unless otherwise noted.

07. Offset studs where required so that finish wall surface will be flush.

08. All exterior walls are 2x6 and all interior walls are 2x6 unless otherwise noted or dimensioned.

09. Ceiling height dimensions are to structural or framing surfaces. Coordinate finishes with interior finish schedule.

10. Gypsum boards shall extend 6" above ceiling at all column cores and walls, unless noted otherwise.

11. Install metal corner beads at all exposed wallboard edges. Install casing beads wherever wallboard, plaster, etc. abuts a dissimilar finish material and provide sealant as required.

12. Extend perimeter walls of core to structure above insulate.

13. Plenum spaces shall be airtight and sealed.

14. Contractors shall verify size and locations of all mechanical equipment pads and bases as well as power and water or drain installations with equipment manufacturer's before proceeding with the work. Changes to accommodate filed conditions or sudstitutions shall be made without additional charge to owner.

15. Ducts penetrating stud walls or shaft walls be provided with necessary frames, bracing and sealant around the opening.

16. Contractor shall provide and install all stiffeners, bracing, back-up plates and supporting brackets required for the installation of all wall mounted or suspended mechanical, electrical or miscellaneous equipment.

17. Contact between dissimilar metal shall be protected

18. Contractor responsible for structural foundation, mechanical, electrical, and plumbing. Architects mechanical, electrical, and plumbing drawings are schematic and only meant for design intent.

19. Roofing system shall bear U.L. listing as a class "A" system. All manufactured materials used shall bear the appropriate U.L. label.

20. Contractor shall verify all concrete and masonry openings in the field prior to the fabrication of doors and frames.

21. Air leakage at exterior doors shall be limited by the following:
a. All doors shall be provided with a seal or astragal
b. Doors mounted on either the inside or outside of an exterior wall shall have a minimum of one-inch lap at each jamb.
c. Doors requiring vertical track or guides shall use a continuous mounting angle, sealed in accordance with "G" listed here.
d. Doors mounted between the jambs shall have a continuous seal or baffle at each jamb.
e. Meeting rails or sections doors and meeting stiles or rails of biparting doors shall be provided with a seal, astragal or baffle.
f. Swinging and revolving doors shall be weather-stripped at the head, sill and jamb.
g. Open exterior joints around window and door frames , between wall and foundations, between wall and roof, between wall panels, at penetrations of utility services through walls, floors and roofs and all other openings in the exterior envelope shall be sealed, caulked, gasketed, or weather-stripped to limit air leakage.

22. All door sizes shown on door schedule are opening sizes. Allowance for thresholds etc. shall be taken off door. All doors and frames shall be reinforced where required for closers, stops and hardware.

SITE CONDITIONS

01. The general contractor shall coordinate with the architect and civil engineer for the final building location, and driveway layout.

02. The general contractor shall dispose of all excess excavated material

03. The general contractor shall maintain the site throughout the course of the project by:
Repairing all earth related scarring such as ruts caused by equipment, spills, etc..;
Repairing or replacing all scarred, broken, or tress damaged by equipment movement.;
Exercise routine weekly removal of all refuse or other discarded material.

04. The general contractor responsible for the coordination and installation of all necessary site utilities including but not limited to power, telephone, water, sewer, gas, cable, etc. The general contractor shall fill in and compact all trenches cut to install utilities on the site. The general contractor shall verify the location of all meters, cans, tanks, lines, etc., with the architect.+

05. The general contractor shall retain any removed topsoil for the finish grading, of which 6" shall be topsoil. All disturbed soil shall be finish graded and machine raked to achieve a uniform surface. This finish grade shall be free of rock and debris greater than 3/4" diameter, twigs, sticks, and other non-soil material and shall taper away from building.

CONDITIONS

01. It is the intent of these plans and specifications to describe a complete and finished project other than items marked "N.I.C." (not in contract).

02. The general contractor and subcontractor(s) shall verify all dimensions and job conditions at the job site sufficiently in advance of work to be performed to assure the orderly progress of the work.

03. The general contractor shall be responsible for the performance of all construction personnel on the site.

04. Code: All codes having jurisdiction shall be observed strictly in the construction or the project, including all applicable state, city and county building, zoning, electrical, mechanical, plumbing and fire codes. The general contractor shall verify all code requirements before commencement of construction and bring any discrepancies between code requirements and the construction documents to the attention of the architect.

05. Cleanup: The general contractor shall maintain the premises clean and free of all trash, debris and shall protect all adjacent work from damage, soiling, paint over-spray, etc. All fixtures, equipment, glazing, floors, etc. shall be left clean and ready for occupancy upon completion of the project.

06. The general contractor shall obtain all required building permits and agency approvals. The general contractor shall provide the owner with copies of permits, licenses, certifications, inspection reports, receipts for payment, and all similar documents.

07. The presence of the architect on the job site does not imply approval of any work. The general contractor must call specific items to the attention of the architect if he wishes to obtain the architects approval.

08. The general contractor shall submit all proposed substitutions in writing to the architect for approval with samples, cost analysis, and sufficient information for evaluation. If a revision or substitution is made without the architect's written approval that does not conform to the contract documents, it will relieve the architect of any liability from the resulting aesthetic effect, subsequent failure, property damage, or personal injury.

09. The general contractor shall perform a high quality, professional work. The work of each trade shall meet or exceed all quality

FIRE SAFETY GENERAL NOTES

Fire Sprinkler System: Installed per NFPA 13 & City of Ketchum Ordinance #1217. An approved fire sprinkler flow bell, Knox box and Fire Department Connection shall be installed in an approved location visible to approaching firefighters. Water service lines to structures shall be hydraulically calculated for size to meet fire sprinkler flow requirements. Fire sprinkler systems shall be annually tested and maintained per NFPA 25. An approved fire department connection and flow bell shall be installed in a location approved by the fire department and the system shall be supervised by an approved alarm system.

NOTE: One electronic set of fire sprinkler system plans must be submitted to the Ketchum Fire Department as well as the State Fire Marshals office and a Ketchum Fire Department Permit must be obtained prior to installation of fire sprinkler systems. Inspections of fire sprinkler systems by the Fire Chief or an appointee are required. Inspections must be scheduled at least 48 hours in advance.

Class 1 Standpipe System:
An approved Class I Standpipe system is required to be installed at every floor level above and below grade and in every stairwell. Fire hose connections shall be located in at an intermediate floor level landing between floors. Fire hose connections to the standpipe system in the stairwells shall be gated 2 ½ inch NHT male couplings. The standpipe system shall be installed by the same contractor that installs the fire sprinkler system.

Fire Detection & Fire Sprinkler Alarm System: Installed per NFPA 72 & City of Ketchum Ordinance #1217.
Alarm system plans shall be submitted to the Ketchum Fire Department for approval and a permit is required prior to installation of alarm systems. Inspections of fire detection systems by the Fire Chief or an appointee are required and shall be scheduled at least 48 hours in advance.

Fire Extinguishers: Fire extinguishers shall be installed and maintained per 2018 IFC Section 906 both during construction and upon occupancy of the building. During construction fire extinguishers shall be placed in a conspicuous, easy to access, unobstructed location that is less than 75' travel distance to any combustibles on site, 30' to any hot work. Upon completion of the project extinguishers shall be required at ever floor landing in every stairwell as well as a minimum of one extinguisher per kitchenet area (under sink). Extinguishers shall be mounted in a conspicuous, easy to access, unobstructed location. Fire extinguishers located in areas other than under kitchenette sinks shall comply with section 307 of the ICC A117.1-2009

City of Ketchum Fire Protection & Defensible Characteristics Outline:
This project shall comply with the City of Ketchum Fire Protection and defensible space characteristics. All exterior windows shall be glazed, and all exterior doors shall be solid core construction, or have a fire rating of not less than 20 minutes. All exterior vents shall be designed and approved to prevent flame or ember penetration and all exterior mesh shall have openings that do not exceed 1/8". Gutters and downspouts shall be non-combustible and shall be provided with an approved means to prevent the accumulation of leaves and debris. **All materials within 12" vertical of finished grade shall be 1 hour rated, non-combustible, or covered with minimum 28-gauge flashing. The area 12" horizontal from the base of a wall shall be finished in a way to prevent any vegetation growing, and for vegetative debris to be easily removed.** Tree crowns extending to within 10 feet of any structure shall be pruned to maintain a minimum horizontal clearance of 10 feet. Tree crowns within 30 feet of any structure shall be pruned to remove limbs located less than 6 feet above the ground surface adjacent to the trees. Non-fire resistive vegetation or growth shall be kept clear of buildings and structures, in such a manner as to provide a clear area for fire suppression operations.

FIRE SAFETY GENERAL NOTES

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NOTE: One electronic set of fire sprinkler system plans must be submitted to the Ketchum Fire Department as well as the State Fire Marshals office and a Ketchum Fire Department Permit must be obtained prior to installation of fire sprinkler systems. Inspections of fire sprinkler systems by the Fire Chief or an appointee are required. Inspections must be scheduled at least 48 hours in advance.

Class 1 Standpipe System: Installed per NFPA 14.
An approved Class I Standpipe system is required to be installed at every floor level above and below grade and in every stairwell. Fire hose connections shall be located in at an intermediate floor level landing between floors. Fire hose connections to the standpipe system in the stairwells shall be gated 2 ½ inch NHT male couplings. The standpipe system shall be installed by the same contractor that installs the fire sprinkler system.

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FARMERPAYNE
ARCHITECTS

Jackson Hole
260 West Broadway, Suite A
Jackson, WY 83001
T.307.264.0080

Sun Valley
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Ketchum, ID 83340
T.208.214.5155

Louisiana
910 Pierremont Rd, Suite 410
Shreveport, LA 71106
T.318.383.3100

ARCHITECT STAMP

LICENSED ARCHITECT
AR 986479
5/18/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE
406 SAGE RD, KETCHUM ID 83340

DATE:	5/18/23
PROJECT #:	SV2202
DRAWN:	NH/AB
ISSUE:	
Design Review	3.31.23
Design Review Response	

A102
GENERAL NOTES & DRAWING INDEX

vs

FARMERPAYNE
ARCHITECTS

Jackson Hole
260 West Broadway, Suite A
Jackson, WY 83001
T.307.264.0080

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351 N Leadville Ave, Suite 204
Ketchum, ID 83340
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ARCHITECT STAMP

LICENSED ARCHITECT
AR 986479
5/4/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM
ID 83340

DATE:	5/4/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:

Design Review	3.31.23
Design Review Response	

A103

RENDERINGS

FARMERPAYNE
ARCHITECTS

Jackson Hole
260 West Broadway, Suite A
Jackson, WY 83001
T.307.264.0080

Sun Valley
351 N Leadville Ave, Suite 204
Ketchum, ID 83340
T.208.214.5155

Louisiana
910 Pierremont Rd, Suite 410
Shreveport, LA 71106
T.318.383.3100

ARCHITECT STAMP

LICENSED ARCHITECT
AR 986479
5/4/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM ID 83340

DATE:	5/4/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:

Design Review	3.31.23
Design Review Response	

A104
RENDERINGS

vs

HEWN RUSTIC RECLAIMED
WESTERN REDCEDAR SIDING

BLACK ALUMINUM GLO WINDOWS

CLEAR HEMLOCK CEILING & SOFFIT

ATLAS GRANITE SELECT STONE

SMOOTH PANELIZED CONCRETE

BLACKENED STEEL

FARMERPAYNE
ARCHITECTS

Jackson Hole
260 West Broadway, Suite A
Jackson, WY 83001
T.307.264.0080

Sun Valley
351 N Leadville, Suite 204
Ketchum, ID 83340
T.208.214.5155

Louisiana
910 Pierremont Rd, Suite 410
Shreveport, LA 71106
T.318.383.3100

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ARCHITECT
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DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM
ID 83340

DATE:	3/31/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:
Design Review

A105
MATERIAL BOARD

v5

LEGEND

- Subject Boundary
- Adjoiners Boundary
- EOA = Edge of Asphalt Roadway
- Building Setback (See Note 5)
- Mountain Overlay District (City of Ketchum)
- 25% Slope Line (Alpine 2022)
- 5' Major Contour Line (Alpine 2022)
- 1' Minor Contour Line (Alpine 2022)
- HSE = Existing Structure
- DECK = Existing Deck
- CONC/DW = Concrete/Driveway
- RTW = Retaining Wall
- Overhead Power
- Water Main
- Water Service
- Sewer Main
- Sewer Service
- CA/TV
- Gas Main
- DL = Dripline of Trees/Edge of Vegetation
- Red Avalanche Hazard Zone (Alpine 2022)
- Blue Avalanche Hazard Zone (Alpine 2022)
- FND 1/2" = Found 1/2" Rebar
- FND ALU = Found Aluminum Cap
- PP = Power Pole
- SMH = Sewer Manhole
- WM = Water Meter
- WV = Water Valve
- PHBOX = Phone Box
- TVBOX = CA/TV Box
- PBOX = Existing Power Box
- PMTR = Proposed Power Meter
- CT = Conifer Tree
- DT = Deciduous Tree
- × 5920.5 Ground Shot/Spot Elevation
- NC No Cap
- AP Angle Point
- COR Corner
- SLAB Garage Slab Elevation
- THRESH Threshold Elevation
- GB Grade Break
- TOP Top of Slope
- TOE Toe of Slope
- HOT Hot Tub/Spa
- SW Concrete Sidewalk
- ( ) Record Bearing & Distance Inst. No. 115701
- [ ] Record Bearing & Distance Inst. No. 210802
- { } Record Bearing & Distance Inst. No. 456235

NOTES

1) Basis of Bearings is Idaho State Plane Coordinate System, NAD83, Central Zone, at Grid in US Survey Feet. Vertical Datum is NAVD1988.
2) Boundary Information is from the Plats of Warm Springs Village Subdivision, Fourth Addition, Instrument Number 115701; Winter Sun Condominium, Instrument Number 210802; Living Springs Townhomes, Instrument Number 456235; Records of Blaine County, Idaho.
3) Refer to the Plat Notes, Conditions, Covenants, & Restrictions on the Original Plat.
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6) Subject Property lies withing the City of Ketchum's Avalanche Zone District and Mountain Overlay Zoning District as defined in Zoning Code Title 15. Persons dwelling in this area should become familiar with these portions of the Ordinance and dwell here at their own risk.
7) Subject property lies within the Blaine County Elk Winter Range Zone.
8) Not all trees and vegetation are shown. Some locations are approximate.
9) Avalanche Zoning is from a 2022 RAMMS Study conducted by Alpine Enterprises Inc. This study is site specific; it should not be applied to adjacent lands.

A SITE SURVEY SHOWING LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.

WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering, and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL LAND SURVEYOR 7048 IDAHO 12/20/22 STATE OF BRUCE SMITH

PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3L23_SiteSurvey2022.dwg 12/12/22 10:38:29 AM MST

NO	DATE	BY
REVISIONS		
SITE SURVEY CONDUCTED ON MAY 6TH, 2022		

SHEET 1 OF 1

LEGEND

- Subject Boundary
- Adjoiners Boundary
- EOA = Edge of Asphalt Roadway
- Building Setback (See Note 5)
- Mountain Overlay District (City of Ketchum)
- 25% Slope Line (Alpine 2022)
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- Red Avalanche Hazard Zone (Alpine 2022)
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- Proposed Structure
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- FND 1/2" = Found 1/2" Rebar
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- DT = Deciduous Tree
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SLOPE RANGES

- Slopes Less Than 15%
- Slopes 15% to 25%
- Slopes 25% to 45%
- Slopes Greater Than 45%

NORTH

GRAPHIC SCALE

8 0 4 8 16 32

(IN FEET)
1 inch = 8 ft.

A SLOPE RANGE MAP SHOWING LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.

WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PREPARED FOR BRADLEY AND GAIL PRATT

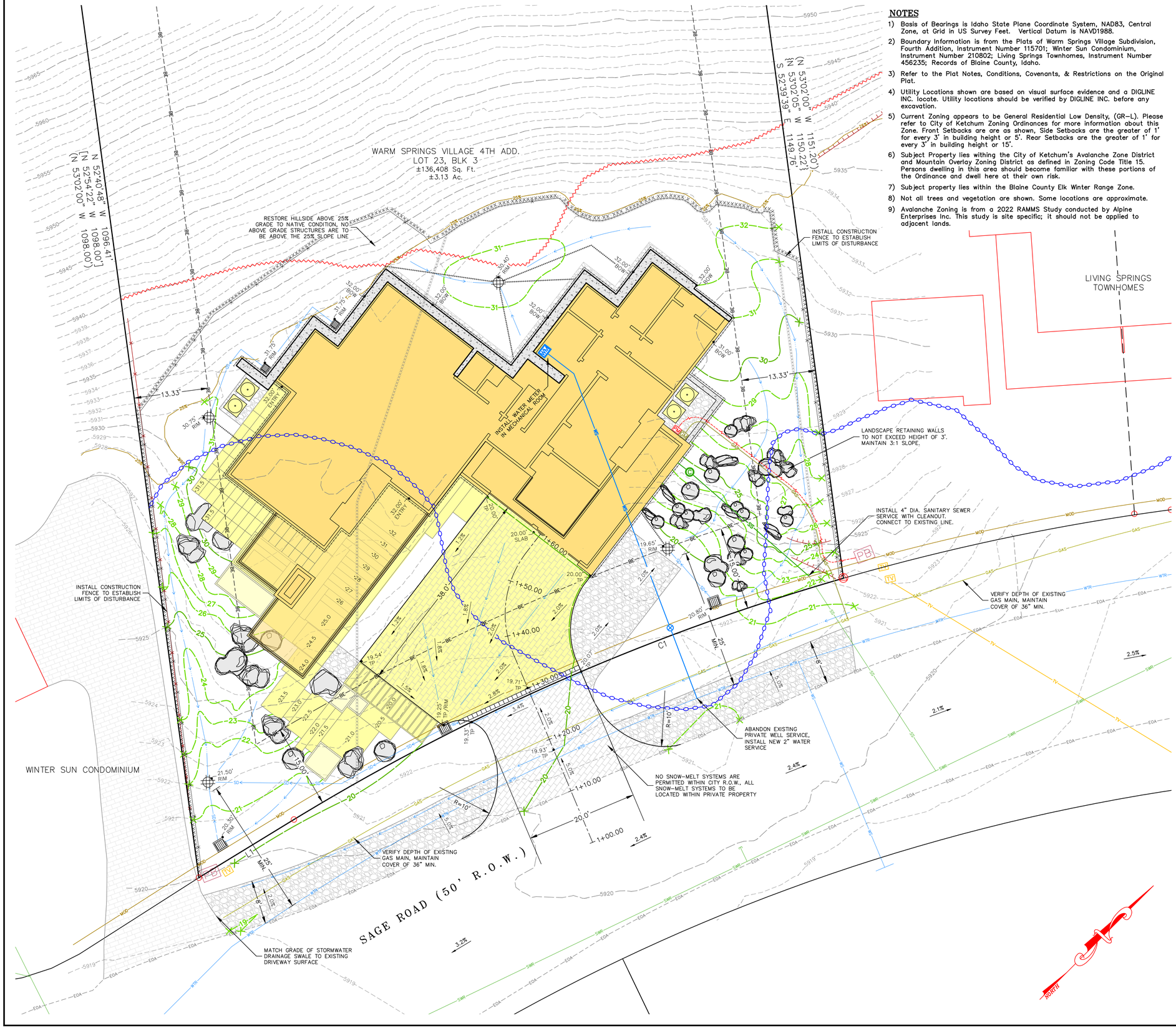
PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_SlopeRanges2023.dwg 3/29/23 2:45:29 PM MST

NO	DATE	BY
REVISIONS		
SITE SURVEY CONDUCTED ON MAY 6TH, 2022		

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering, and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL LAND SURVEYOR — LICENSED — 10480 — 29MAR23 — STATE OF IDAHO — BRUCE SMITH

SHEET 1 OF 1



NOTES

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LEGEND

- Subject Boundary
- Adjoiners Boundary
- Existing Edge of Asphalt Roadway
- Building Setback (See Note 5)
- Mountain Overlay District (City of Ketchum)
- 25% Slope Line (Alpine 2022)
- Existing 5' Major Contour Line (Alpine 2022)
- Existing 1' Minor Contour Line (Alpine 2022)
- Existing Paver Driveway
- Proposed 5' Major Contour
- Proposed 1' Minor Contour
- Proposed Drainage Flowline
- Proposed 6" Dia. PVC Storm Drain Pipe
- Proposed 4" Dia. Footing Drain Pipe
- Proposed 4" Dia. Roof Drain Pipe
- Proposed L.O.D. with Silt Fence (Construction)
- Proposed L.O.D. (Demolition)
- Existing Structure
- Existing Retaining Wall (To Be Removed)
- Existing Wooden Fence (36" Tall, To Remain)
- Existing Overhead Power
- Proposed Underground Power
- Existing 8" Water Main
- Existing Water Service
- Proposed 2" Water Service (C2.0, Detail 4)
- Existing 8" Sewer Main
- Existing Sewer Service
- Proposed Sewer Service (C2.0, Detail 4)
- Existing CA/TV
- Existing Gas Main
- Proposed Gas Service
- Red Avalanche Hazard Zone (Alpine 2022)
- Blue Avalanche Hazard Zone (Alpine 2022)
- Found 1/2" Rebar
- Found Aluminum Cap
- Existing Power Pole
- Existing Sewer Manhole
- Proposed Sewer Cleanout
- Existing Water Meter
- Existing Water Valve
- Existing Well
- Proposed Water Meter (C2.0, Detail 1)
- Proposed Water Valve/Curb Stop (C2.0, Detail 1)
- Existing Phone Box
- Existing CA/TV Box
- Existing Power Box
- Proposed Power Meter
- Proposed Gas Meter
- 1.0% Existing Road Grade
- 1.0% Proposed Grade
- 92.00' TA Proposed Finish Grade Spot Elevation Location Description
- 22.0 Proposed Finish Grade Spot Elevation
- Proposed Structure
- Proposed Concrete Avalanche Protection Wall
- Proposed Heated Paver Driveway (C3.0, Detail 8)
- Proposed Non–Heated Paver Driveway within City R.O.W. (C3.0, Detail 8)
- Proposed Asphalt Patch & Saw–Cut Line (C2.0, Detail 2)
- Proposed Landscaping (See Landscape Plan for Patio Elevations)
- Proposed Landscaping Steel Planter Box
- Proposed Boulders (C3.0, Detail 9)
- Proposed Gravel (C3.0, Detail 6)
- Proposed Landscape Dry Well (C3.0, Detail 7)
- Proposed Heated Landscape Catch Basin
- Proposed 6" Driveway Trench Drain

SLAB Garage Slab Elevation
BOW Bottom of Wall/Adjacent Grade Elevation
ENTRY Stone Entry Elevation
RIM Dry Well/Catch Basin Rim Elevation
TR Top of Retainage Elevation
BR Bottom of Retainage Elevation
TP Top of Pavers Elevation
( ) Record Bearing & Distance Inst. No. 115701
[ ] Record Bearing & Distance Inst. No. 210802
{ } Record Bearing & Distance Inst. No. 456235

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C1	404.52'	107.85'	107.53'	S 21°18'01" W
(C1)	(404.52')	(108.10")	–	–
LINE	LENGTH	BEARING	–	–
L1	19.97'	S 13°33'19" W	–	–
(L1)	(20.00')	(S 13°17'38" W)	–	–

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

NORTH

A SITE GRADING, R.O.W. ENCROACHMENT, & UTILITY PLAN SHOWING LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD. WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering, Consulting and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727–1988 727–1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER — 11473 — IDAHO — BRADLEY A. NELSON

NO	DATE	BY
REVISIONS		
PRELIMINARY ONLY; NOT FOR CONSTRUCTION		
DESIGN REVIEW SUBMITTAL		AHN
1 REVISED FOR CITY COMMENTS	17MAY23	AHN
2 REVISED FOR CITY COMMENTS	30MAY23	AHN

PROJECT PATH AND PRINT DATE U:\LD3_214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_CivilROW2022.dwg 5/30/23 3:28:37 PM MST

C1.0

GENERAL CONSTRUCTION NOTES

1) The location of existing underground utilities are shown on the plans in an approximate way. The contractor shall be responsible for locating existing utilities during the construction. The contractor agrees to be fully responsible for any and all damages which result from his failure to accurately locate and preserve any and all underground utilities.

2) See the Building Plan from Farmer Payne Architects and the Landscape Plan from Garden Space Design for the remainder of the design.

3) Contractor shall assure positive drainage away from the building and driveway.

4) Contractor shall be responsible for dust control during construction of all items hereon. Dust control shall be continuous during construction, 24 hours per day 7 days per week. The contractor shall follow the requirements of the Storm Water Pollution Prevention Program at all times until permanent erosion control is established.

5) The Trench Drain shall be a 6" wide HDPE channel with a 0.75 built in channel slope (Zurn Flo-Thru Model Z886 or equivalent). Grate shall be ductile iron with a slotted pattern. All components shall be rated for H-20 loading.

6) All construction shall be in accordance with the most current edition of the Idaho Standards for Public Works Construction, ISPWC, and the City of Ketchum, Idaho, Codes and Standards. The contractor shall be responsible for obtaining and keeping a copy of the ISPWC and the City of Ketchum Codes and Standards on site during construction.

7) Per Idaho Code, 55-1613, the contractor shall retain and protect all monuments, accessories to corners, benchmarks, and points set in control surveys. All monuments, accessories to corners, benchmarks, and points set in control surveys that are lost or disturbed by construction shall be reestablished and re-monumented, at the expense of the agency or person causing their loss or disturbance under the direction of a professional land surveyor.

8) The contractor shall clean up the site after construction so that it is in a condition equal to or better than that which existed prior to construction.

9) The contractor shall be required to obtain all the necessary permits prior to construction and shall check with the City of Ketchum for permits the owner may have already obtained.

10) All mains and services shall comply with IDAPA 58.01.08.542.07.a and IDAPA 58.01.08.542.07.b which address the requirements for separation distances between potable water lines (including mains and service lines) with non-potable lines. In addition, water services shall be constructed with at least 25 feet horizontal separation from infiltration trenches and dry wells.

11) Potable/non-potable crossings shall comply with ISPWC Standard Drawing SD-407 and IDAPA section 58.01.08.542.07.

12) Sewer service lines shall be placed at a slope of 2%, with markers per ISPWC. Cleanouts are required at changes in alignment, grade, and minimum 150' length.

13) All pipe shall be bedded with (ISPWC) Type I bedding material.

14) Trenches shall be backfilled and compacted to a minimum of 95% of maximum density as determined by AASHTO T-99.

15) The contractor shall pressure test all sewer service connections in accordance with Idaho Standards for Public Works Construction, ISPWC.

16) All clearing and grubbing shall conform to ISPWC Section 201 and City of Ketchum standards of excavation and backfill.

17) All excavation and embankment shall conform to ISPWC Section 202 and City of Ketchum standards for excavation and backfill. Excavated subgrade shall be compacted and all unsuitable Sections removed and replaced with structural fill as determined by the engineer per ISPWC Section 204. Minimum compaction of placed material shall be 95% of maximum laboratory density as determined by AASHTO T-99 or IDT T-91.

18) All 2" minus aggregate shall be placed in conformance with ISPWC Section 802. It shall be compacted per ISPWC Section 202 and the City of Ketchum standards. 2" minus crushed aggregate material shall conform to ISPWC Section 802 Type II and to the City of Ketchum specifications. Minimum compaction of placed material shall be 95% of maximum laboratory density as determined by AASHTO T-99 or IDT T-91.

19) All 3/4" minus aggregate shall be placed in conformance with ISPWC Section 802. It shall be compacted per ISPWC Section 202 and the City of Ketchum standards. 3/4" minus crushed aggregate for leveling course shall conform to ISPWC Table 802 Type I and to the City of Ketchum specifications. Minimum compaction of placed material shall be 95% of maximum laboratory density as determined by AASHTO T-99 or IDT T-91.

20) All asphaltic concrete pavement work shall conform to ISPWC Section(s) 805, 810, and 811 for Class II pavement and to the City of Ketchum standards. Asphalt aggregate shall be 1/2" nominal size conforming to Table 803b in ISPWC Section 803. Asphalt binder shall be pg 58-28 conforming to Table A-1 in ISPWC Section 805.

21) All concrete work shall conform to ISPWC Sections 701 and 703. All concrete shall be 3,000 psi minimum. 28 day, as defined in ISPWC Section 703, Table 1.C.

22) All edges of existing asphalt paving shall be saw cut a minimum of 24" to provide a clean pavement edge for matching. No wheel cutting shall be allowed. Pavement shall be cut prior to paving to prevent damage to the cut edge.

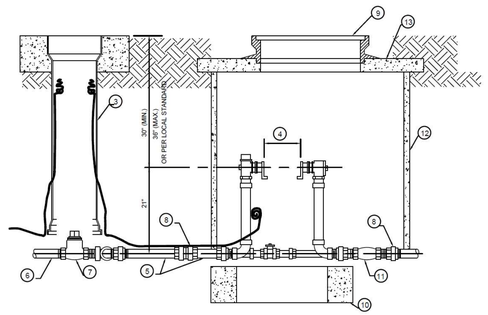
23) The contractor shall be responsible for providing traffic control per the current edition of the US Department of Transportation Manual of Uniform Traffic Control Devices (MUTCD).

24) All drainage is to be retained on-site. Grade open areas to drain to Dry Wells as shown hereon.

25) Grade away from foundation at 5%.

26) Alpine Enterprises Inc. is not responsible for any deviation from these plans, unless such changes have been authorized in writing.

27) All right-of-way improvements per sheet C1.0 must be completed prior to issuance of a temporary or final Certificate of Occupancy unless otherwise agreed upon in writing by the City.

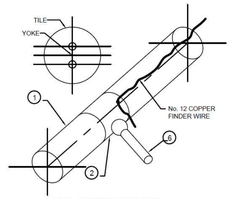


WATER SERVICE CONNECTION DETAIL

NTS

NOTES

1. WATER MAIN PER ISPWC SECTION 401.
2. MIP X PAC CORP STOPS: 200 PSI POLY PIPE WITH INSERTS FOR FOR SERVICE LINES FROM MAIN TO CORPS STOPS AND INTO METER VAULT.
3. VALVE BOX
4. 1-1/2" METER: 13-1/4" WITH GASKETS
   2" METER: 17-1/4" WITH GASKETS
   WATER METER FURNISHED AND INSTALLED BY THE CITY. (PAID BY CUSTOMER WITH CONNECTION FEES.)
5. 6" LONG RED BRASS NIPPLE
6. SERVICE LINE: 1-1/2" OR 2", 200 PSI POLYETHYLENE PIPE WITH PACK JOINT BRASS FITTINGS AND STAINLESS STEEL INSERTS.
7. FORD BALL VALVE CURB STOP WITH RISER AND LOCKING LID. (IF REQUIRED)
8. RED BRASS UNION.
9. STANDARD 24" DIA. MANHOLE RING & "WATER" COVER; 2" HOLE IN LID FOR RADIO READ UNIT.
10. 2" X 35" O.D. CONCRETE GRADE RING) UNDER YOKE.
11. BALL VALVE TO BE INSTALLED IN METER VAULT. NO OTHER EQUIPMENT SHALL BE PERMITTED WITHIN THE METER VAULT.
12. 36" DIA. PRECAST CONCRETE MANHOLE.
13. 4" X 35" O.D. CONCRETE GRADE RING.



TAP CONNECTION

NTS

NOTES:

(A) ALL PRODUCTS AS NOTED OR APPROVED SUBSTITUTION.

(B) THE DIAMETER (1-1/2" OR 2") OF EACH APPURTENANCE SHOWN HEREON IS THE SAME AS THE METER SIZE.

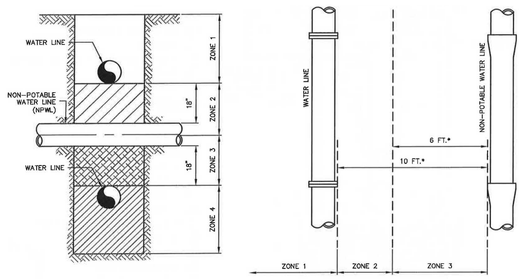
(C) NO BY-PASS ALLOWED ON METER SETTERS FOR LANDSCAPE OR PRESSURIZED IRRIGATION SYSTEM.

(D) NO GALVANIZED PIPE OR YELLOW BRASS FITTINGS.

(E) NO TAPS WITHIN ONE FOOT OF THE PIPE ENDS.

(1) WATER SERVICE CONNECTION (1-1/2", 2")

ISPWC - SD-402
NOT TO SCALE



* DISTANCES ARE HORIZONTAL.

VERTICAL SEPARATION REQUIREMENTS

ZONE 1: A) WATER AND NPWL MUST BE SEPARATED BY AT LEAST 18" AND B) ONE FULL, UNCUT LENGTH OF BOTH PWL AND NPWL PIPE MUST BE CENTERED ON THE CROSSING SO THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM THE CROSSING.

ZONE 2: A) ONE FULL, UNCUT LENGTH OF BOTH PWL AND NPWL PIPE MUST BE CENTERED ON THE CROSSING SO THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM THE CROSSING.

AND EITHER B) NPWL MUST BE CONSTRUCTED TO WATER MAIN STANDARDS AND PRESSURE TESTED FOR WATER TIGHTNESS FOR A HORIZONTAL DISTANCE OF 10 FEET ON BOTH SIDES OF CROSSING.

OR C) EITHER THE NPWL, OR WATER LINE OR BOTH MUST BE ENCASED WITH A SLEEVEING MATERIAL ACCEPTABLE TO DEQ FOR A HORIZONTAL DISTANCE OF 10 FEET ON BOTH SIDES OF THE CROSSING.

ZONE 3: SAME REQUIREMENTS AS ZONE 2 EXCEPT THE NPWL MUST ALSO BE SUPPORTED ABOVE THE CROSSING TO PREVENT SETTLING.

ZONE 4: SAME REQUIREMENTS AS ZONE 1 EXCEPT THE NPWL MUST ALSO BE SUPPORTED ABOVE THE CROSSING TO PREVENT SETTLING.

HORIZONTAL SEPARATION REQUIREMENTS

ZONE 1: A) NO SPECIAL REQUIREMENTS.

ZONE 2: A) NO SPECIAL REQUIREMENTS FOR POTABLE OR NON-POTABLE SERVICES.

B) WATER AND NPWL SEPARATED BY AT LEAST 6 FEET AT OUTSIDE WALLS.

AND C) WATER AT LEAST 18 INCHES HIGHER IN ELEVATION THAN THE NPWL.

AND EITHER D) NPWL CONSTRUCTED TO WATER MAIN STANDARDS AND PRESSURE TESTED FOR WATER TIGHTNESS.

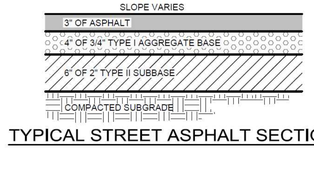
OR E) SITE SPECIFIC REQUIREMENTS APPROVED BY DEQ.

ZONE 3: NOT ALLOWED WITHOUT DEQ WAIVER.

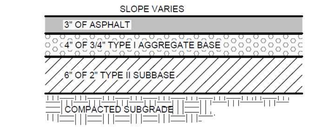
NOTE: SANITARY SEWER FORCE MAINS MUST HAVE MIN. 10' HORIZONTAL SEPARATION AND 18" VERTICAL SEPARATION. ZONE 2 AND ZONE 3 PLACEMENTS ARE NOT ALLOWED WITHOUT A WAIVER GRANTED BY DEQ.

(3) POTABLE AND NON-POTABLE WATER LINE (NPWL) SEPERATION

ISPWC - SD-407
NOT TO SCALE



TYPICAL STREET ASPHALT SECTION



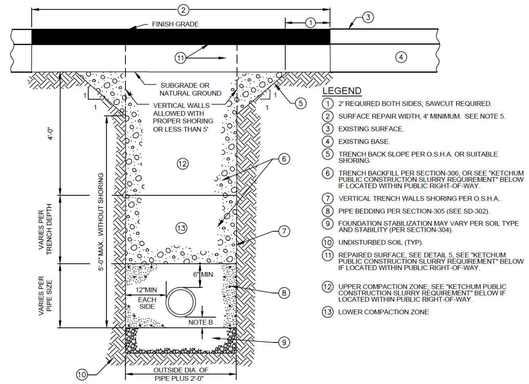
TYPICAL ALLEY ASPHALT SECTION

NOTES:

1. SUBBASE CAN BE 2" TYPE II OR ¾" TYPE I CRUSHED AGGREGATE BASE COURSE.
2. MATERIALS SHALL CONFORM WITH CURRENT ISPWC STANDARDS, DIVISION 800 AGGREGATES AND ASPHALT.
3. PAVEMENT SECTION MAY BE MODIFIED IF A PROJECT SPECIFIC GEOTECHNICAL REPORT, STAMPED BY A LICENSED ENGINEER, IS PROVIDED.

(2) TYPICAL ROAD SECTIONS

CITY OF KETCHUM - SD-3
NOT TO SCALE



LEGEND

1. 2' REQUIRED BOTH SIDES, SAWCUT REQUIRED.
2. SURFACE REPAIR WIDTH, 4' MINIMUM. SEE NOTE 5.
3. EXISTING SURFACE.
4. EXISTING BASE.
5. TRENCH BACK SLOPE PER O.S.H.A. OR SUITABLE SHORING.
6. TRENCH BACKFILL PER SECTION-306, OR SEE "KETCHUM PUBLIC CONSTRUCTION SLURRY REQUIREMENT" BELOW IF LOCATED WITHIN PUBLIC RIGHT-OF-WAY.
7. VERTICAL TRENCH WALLS SHORING PER O.S.H.A..
8. PIPE BEDDING PER SECTION-305 (SEE SD-302).
9. FOUNDATION STABILIZATION MAY VARY PER SOIL TYPE AND STABILITY (PER SECTION-304).
10. UNDISTURBED SOIL (TYP).
11. REPAIRED SURFACE, SEE DETAIL 5, SEE "KETCHUM PUBLIC CONSTRUCTION SLURRY REQUIREMENT" BELOW IF LOCATED WITHIN PUBLIC RIGHT-OF-WAY.
12. UPPER COMPACTION ZONE. SEE "KETCHUM PUBLIC CONSTRUCTION SLURRY REQUIREMENT" BELOW IF LOCATED WITHIN PUBLIC RIGHT-OF-WAY.
13. LOWER COMPACTION ZONE

KETCHUM PUBLIC CONSTRUCTION SLURRY REQUIREMENT

IN AREAS WHERE IT IS NECESSARY TO CUT THE ASPHALT PAVEMENT AND DIG A TRENCH FOR BURIAL OF CONDUIT CABLE OR OTHER CITY UTILITY, THE TRENCH SHALL BE BACKFILLED WITH A LEAN CONCRETE MIX TO THE BOTTOM OF FINISH SURFACE MATERIAL WITH THE FOLLOWING PROPORTIONS OF MATERIALS:

COARSE AGGREGATE (¾" MINUS)	:	2,600 LBS
SAND	:	600 LBS
PORTLAND CEMENT	:	94 LBS
WATER	:	11 GAL (MAX.)

WATER CONTENT IS MAXIMUM AND MAY BE REDUCED DOWNWARD. CARE SHALL BE TAKEN TO ASSURE THAT EXCESS WATER IS NOT PRESENT IN THE MIXING DRUM PRIOR TO CHARGING THE MIXER WITH MATERIALS. THOROUGH MIXING WILL BE REQUIRED PRIOR TO DISCHARGE.

NO COMPACTION, VIBRATION, OR FINISHING IS REQUIRED. THE LEAN CONCRETE MIX SHALL BE STRUCK OFF AT OR BELOW THE ELEVATION OF THE PLANTMIX SURFACING WITH A SQUARE-NOSE SHOVEL OR SIMILAR HAND TOOL. THE BACKFILL MIX SHALL BE ALLOWED TO SET FOR A MINIMUM OF 2 HOURS BEFORE THE PERMANENT PLANTMIX SURFACING IS PLACED TO COMPLETE THE TRENCH REPAIR. TEMPORARY PLACEMENT OF ASPHALT COLD MIX SURFACING MAY BE NECESSARY TO ACCOMMODATE TRAFFIC WITHIN THE FIRST 2 HOURS OF BACKFILL PLACEMENT PRIOR TO COMPLETING THE PERMANENT REPAIR.

NOTES:

1. TRENCH EXCAVATION PER SECTION-301.
2. PIPE BEDDING PER SECTION-305.
3. BACKFILL AND COMPACTION PER SECTION-306.
4. SURFACE REPAIR AND BASE PER DETAIL 3.
5. ASPHALT PAVEMENT FOR SURFACE REPAIR SHALL BE IN ACCORDANCE WITH PLANS AND ISPWC SECTIONS 805, 810, AND 811 FOR CLASS II PAVEMENT. ASPHALT AGGREGATE SHALL BE ½" (13MM) NOMINAL SIZE CONFORMING TO TABLE 803B IN ISPWC SECTION 803. ASPHALT BINDER SHALL BE PG 58-28 CONFORMING TO TABLE A-1 IN ISPWC SECTION 805.
6. IF TRENCH IMPACTS CROWN OF ROADWAY, CROWN MUST BE MAINTAINED AND POSITIVE DRAINAGE PROVIDED.

(4) TYPICAL TRENCH

CITY OF KETCHUM - SD-12
NOT TO SCALE

A SITE GRADING, R.O.W. ENCROACHMENT, & UTILITY PLAN SHOWING
LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.
WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering, and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 fax 727-1987
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER — STATE OF IDAHO — ALLEN NELSON — 23295 — 30MAY23

NO	DATE	BY
1	17MAY23	AHN
2	30MAY23	AHN

REVISIONS

PRELIMINARY ONLY, NOT FOR CONSTRUCTION
DESIGN REVIEW SUBMITTAL
REVISED FOR CITY COMMENTS
REVISED FOR CITY COMMENTS

PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_CivilROW2022.dwg 5/30/23 3:28:37 PM MST

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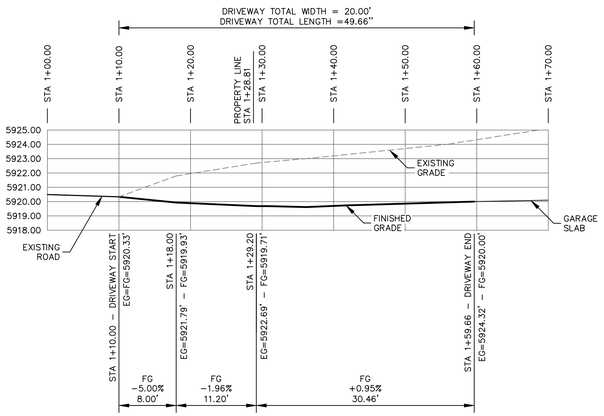
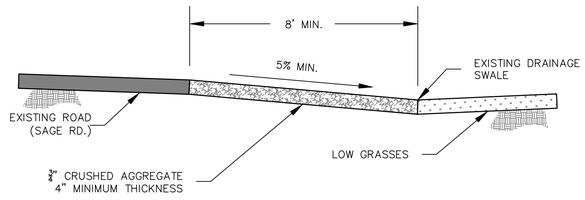


5 DRIVEWAY PROFILE VIEW
LOT 23
VERT: 1"=5'
HORIZ: 1"=10'



6 CROSS-SECTION: ROADSIDE SWALE
R.O.W. SAGE ROAD
NOT TO SCALE

NOTES

A) Material shall be pervious/permeable to allow drainage.

B) Surface must allow for vehicle parking and be consistent along the entire property frontage.

C) Material within the first eight (8) feet from edge of asphalt (Street) shall be distinct from driveway and rest of property in order to visually appear available for parking.

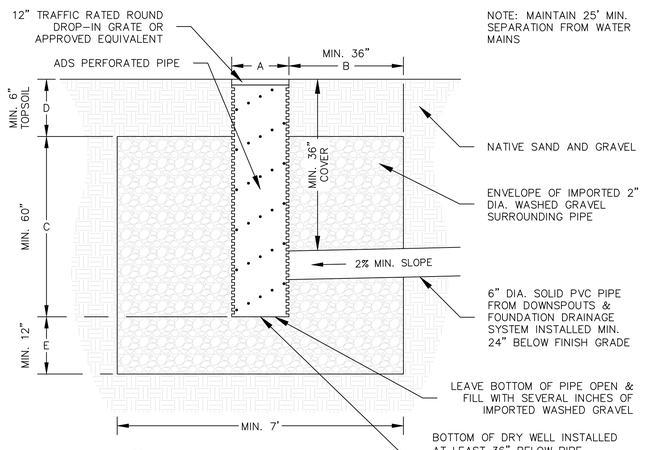
D) Grading and drainage improvements as required by City Engineer – Minimum 5% slope.

E) No obstructions, such as boulders or berms.

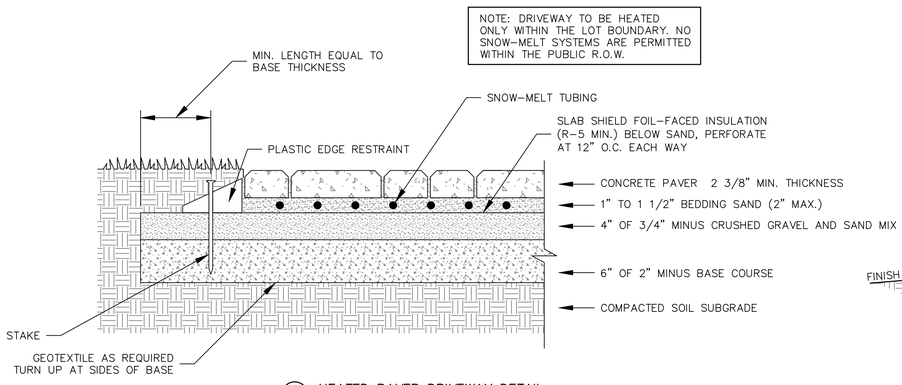
F) No buried irrigation systems within the first eight (8) feet the edge of asphalt (Street). Surface irrigation lines are permitted beyond the first eight (8) feet, however pop-up heads are not permitted anywhere in the ROW.

G) No live plant material within the first eight (8) feet from edge of asphalt (Street). Low ground cover plant material, such as turf grass, is permitted beyond the first eight (8) feet. Drought-tolerant species are preferred.

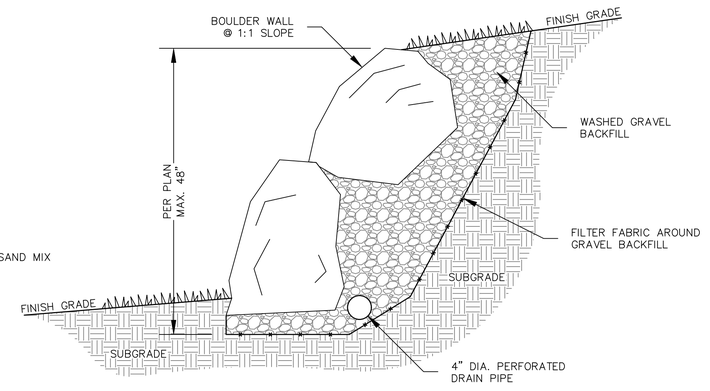
H) No snow-melt systems.



7 LANDSCAPE DRY WELL DETAIL
NOT TO SCALE



8 HEATED PAVER DRIVEWAY DETAIL
NOT TO SCALE



9 BOULDER WALL
NOT TO SCALE

PROJECT PATH AND PRINT DATE U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_CivilROW2022.dwg 5/30/23 3:28:37 PM MST

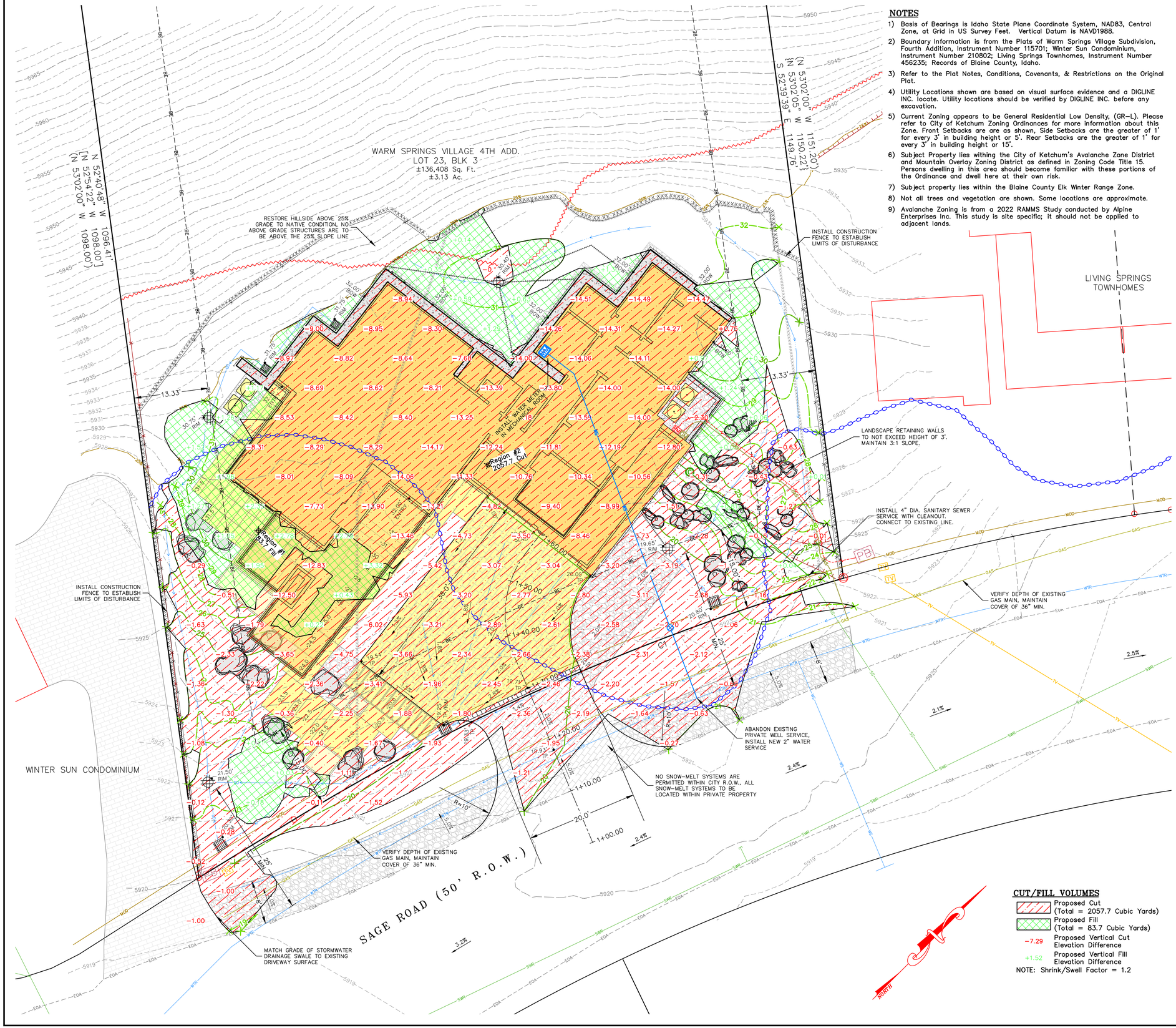
Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering, and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER — STATE OF IDAHO — ALEX NELSON — 23214 — EXPIRES: 6/30/24

A SITE GRADING, R.O.W. ENCROACHMENT, & UTILITY PLAN SHOWING
LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.
WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR BRADLEY AND GAIL PRATT

NO	REVISIONS	DATE	BY
	PRELIMINARY ONLY: NOT FOR CONSTRUCTION		
	DESIGN REVIEW SUBMITTAL		
1	REVISED FOR CITY COMMENTS	17MAY23	AHN
2	REVISED FOR CITY COMMENTS	30MAY23	AHN

C3.0



NOTES

1) Basis of Bearings is Idaho State Plane Coordinate System, NAD83, Central Zone, at Grid in US Survey Feet. Vertical Datum is NAVD1988.
2) Boundary Information is from the Plats of Warm Springs Village Subdivision, Fourth Addition, Instrument Number 115701; Winter Sun Condominium, Instrument Number 210802; Living Springs Townhomes, Instrument Number 456235; Records of Blaine County, Idaho.
3) Refer to the Plat Notes, Conditions, Covenants, & Restrictions on the Original Plat.
4) Utility Locations shown are based on visual surface evidence and a DIGLINE INC. locate. Utility locations should be verified by DIGLINE INC. before any excavation.
5) Current Zoning appears to be General Residential Low Density, (GR–L). Please refer to City of Ketchum Zoning Ordinances for more information about this Zone. Front Setbacks are are as shown, Side Setbacks are the greater of 1' for every 3' in building height or 5'. Rear Setbacks are the greater of 1' for every 3' in building height or 15'.
6) Subject Property lies withing the City of Ketchum's Avalanche Zone District and Mountain Overlay Zoning District as defined in Zoning Code Title 15. Persons dwelling in this area should become familiar with these portions of the Ordinance and dwell here at their own risk.
7) Subject property lies within the Blaine County Elk Winter Range Zone.
8) Not all trees and vegetation are shown. Some locations are approximate.
9) Avalanche Zoning is from a 2022 RAMMS Study conducted by Alpine Enterprises Inc. This study is site specific; it should not be applied to adjacent lands.

LEGEND

- Subject Boundary
- Adjoiners Boundary
- Existing Edge of Asphalt Roadway
- Building Setback (See Note 5)
- Mountain Overlay District (City of Ketchum)
- 25% Slope Line (Alpine 2022)
- Existing 5' Major Contour Line (Alpine 2022)
- Existing 1' Minor Contour Line (Alpine 2022)
- Existing Paver Driveway
- Proposed 5' Major Contour
- Proposed 1' Minor Contour
- Proposed Drainage Flowline
- Proposed 6" Dia. PVC Storm Drain Pipe
- Proposed 4" Dia. Footing Drain Pipe
- Proposed 4" Dia. Roof Drain Pipe
- Proposed L.O.D. with Silt Fence (Construction)
- Proposed L.O.D. (Demolition)
- Existing Structure
- Existing Retaining Wall (To Be Removed)
- Existing Wooden Fence (36" Tall, To Remain)
- Existing Overhead Power
- Proposed Underground Power
- Existing 8" Water Main
- Existing Water Service
- Proposed 2" Water Service (C2.0, Detail 4)
- Existing 8" Sewer Main
- Existing Sewer Service
- Proposed Sewer Service (C2.0, Detail 4)
- Existing CA/TV
- Existing Gas Main
- Proposed Gas Service
- Red Avalanche Hazard Zone (Alpine 2022)
- Blue Avalanche Hazard Zone (Alpine 2022)
- Found 1/2" Rebar
- Found Aluminum Cap
- Existing Power Pole
- Existing Sewer Manhole
- Proposed Sewer Cleanout
- Existing Water Meter
- Existing Water Valve
- Existing Well
- Proposed Water Meter (C2.0, Detail 1)
- Proposed Water Valve/Curb Stop (C2.0, Detail 1)
- Existing Phone Box
- Existing CA/TV Box
- Existing Power Box
- Proposed Power Meter
- Proposed Gas Meter
- 1.0% Existing Road Grade
- 1.0% Proposed Grade
- 92.00' TA Proposed Finish Grade Spot Elevation Location Description
- 22.0 Proposed Finish Grade Spot Elevation
- Proposed Structure
- Proposed Concrete Avalanche Protection Wall
- Proposed Heated Paver Driveway (C3.0, Detail 8)
- Proposed Non–Heated Paver Driveway within City R.O.W. (C3.0, Detail 8)
- Proposed Asphalt Patch & Saw–Cut Line (C2.0, Detail 2)
- Proposed Landscaping (See Landscape Plan for Patio Elevations)
- Proposed Landscaping Steel Planter Box
- Proposed Boulders (C3.0, Detail 9)
- Proposed Gravel (C3.0, Detail 6)
- Proposed Landscape Dry Well (C3.0, Detail 7)
- Proposed Heated Landscape Catch Basin
- Proposed 6" Driveway Trench Drain

SLAB	Garage Slab Elevation
BOW	Bottom of Wall/Adjacent Grade Elevation
ENTRY	Stone Entry Elevation
RIM	Dry Well/Catch Basin Rim Elevation
TR	Top of Retainage Elevation
BR	Bottom of Retainage Elevation
TP	Top of Pavers Elevation
( )	Record Bearing & Distance Inst. No. 115701
[ ]	Record Bearing & Distance Inst. No. 210802
{ }	Record Bearing & Distance Inst. No. 456235

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C1	404.52'	107.85'	107.53'	S 21°18'01" W
(C1)	(404.52')	(108.10'')	–	–
LINE	LENGTH	BEARING	–	–
L1	19.97'	S 13°33'19" W	–	–
(L1)	(20.00')	(S 13°17'38" W)	–	–

CUT/FILL VOLUMES

Proposed Cut (Total = 2057.7 Cubic Yards)
Proposed Fill (Total = 83.7 Cubic Yards)
-7.29 Proposed Vertical Cut Elevation Difference
+1.52 Proposed Vertical Fill Elevation Difference
NOTE: Shrink/Swell Factor = 1.2

GRAPHIC SCALE

8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

A SITE GRADING, R.O.W. ENCROACHMENT, & UTILITY PLAN SHOWING
LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.
WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR BRADLEY AND GAIL PRATT

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email: bsmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER — ALEX N. NELSON — 17675 — IDAHO — STATE OF IDAHO — 5/30/23

NO	REVISIONS	DATE	BY
	PRELIMINARY ONLY; NOT FOR CONSTRUCTION		
	DESIGN REVIEW SUBMITTAL		
1	REVISED FOR CITY COMMENTS	17MAY23	AHN
2	REVISED FOR CITY COMMENTS	30MAY23	AHN

PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3L123_CivilROW2022.dwg 5/30/23 3:28:37 PM MST

C4.0

PLAN KEY

- PROPOSED PAVER DRIVEWAY (1,450 SQ FT) TOTAL (TECHO-BLU 80 PAVERS)
- HEATED SLABS AT WALKWAY ENTRY (68 SQ FT)(OSLO STONE)
- HEATED DRIVEWAY W/ SLABS (1,047 SQ FT) COMBINED AREA
- GRASSPAVE^2 (262 SQ FT)
- SNOW STORAGE (30% x 2,507 = 752 SQ FT) (989 SQ FT) PROVIDED
- CONCRETE STEPS / LANDINGS (226 SQ FT)
- PATIO / WALKWAY STONE (240 SQ FT) (OSLO STONE)
- STONE SLAB STEPS (261 SQ FT) (WINDSOR GRAY STONE)
- LANDSCAPE BOULDERS (CHIEF CLIFF)
- IRRIGATED NATIVE GRASS (4,285 SQ FT)
- R.O.W. SAGE COUNTRY SHORT GRASS MIX (1,042 SQ FT)
- (2") CRUSHED OAKLEY STONE (150 SQ FT)
- MULCHED PLANT BEDS (492 SQ FT)
- STEEL PLANTER (IRRIGATED) (138 SQ FT)
- RED AVALANCHE HAZ. ZONE
- BLUE AVALANCHE HAZ. ZONE
- 25% SLOPE
- MOUNTAIN OVERLAY DISTRICT
- UTILITIES - POWER & GAS
- FIRE HOSE REACH
- (1/4" X 10") STEEL EDGING
- PROPERTY LINE
- BUILDING ENVELOPE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- EDGE OF ASPHALT
- (24") LANDSCAPE DRY-WELL
- (12") LANDSCAPE DRY-WELL
- (12") LANDSCAPE CATCH BASIN
- ROOF DRIP LINE
- EXISTING FENCE

SNOW STORAGE CALCULATIONS

PAVER DRIVEWAY & GRASSPAVE AREAS:	1,712 SQ. FT.
PAVER PATIOS, STONE STEPS & CONCRETE STEPS:	795 SQ. FT.
TOTAL HARDSCAPE AREA	**2,507 SQ. FT.**
SNOW STORAGE REQUIRED: 2,507 SQ.FT. x 30% =	752 SQ. FT.
TOTAL SNOW STORAGE PROVIDED: 362 + 234 + 393 =	**989 SQ. FT.**

SPECIAL NOTE: NO SNOW STORAGE DIMENSION IS LESS THAN 5'-0"

LANDSCAPE LIGHTING KEY

10	PATH LIGHT - KICHLER TWO ARM PATH LIGHT
10	STEP LIGHT - ICON HORIZONTAL STEP LIGHT

NOTE: ALL LIGHT FIXTURES TO BE COMPLIANT WITH LOCAL DARK SKY PRESERVATION ORDINANCES

LANDSCAPE LIGHTING CALCULATIONS

LANDSCAPE LIGHTING PROPOSED:

10 PATH LIGHTS x 85 LUMENS/LIGHT = 850
10 STEP LIGHTS x 68 LUMENS/LIGHT = 680
= 850 + 680 = 1,530 TOTAL LUMENS

TOTAL LUMENS PROPOSED: 1,530 LUMENS

NOTE: DISTURBED HILLSIDE AREAS TO BE RESTORED TO MATCH EXISTING SLOPE AND CONTOURS AS WELL AS TO RE-ESTABLISH EXISTING PLANT COMMUNITY. (SEE L-3.0 FOR DETAILS)

RESIDENCE
MAIN FLOOR
(FFE 5932)

HVAC UNITS W/ PRIVACY SCREEN TO MATCH SIDING OF HOUSE

HVAC UNITS IN RECESSED AREA

UTILITIES (SEE CIVIL C1.0)

BOULDER ROCKERY - NO BOULDERS WILL EXCEED A HIEGHT OF 30" ABOVE GRADE; MAINTAIN 3:1 SLOPE (SEE CIVIL C1.0)

MONARCH STAINLESS STEEL ENERGY EFFICIENT SPA W/ AUTOMATIC COVER BY DIAMOND SPA; RECESSED INTO PATIO. (SEE L-2.0 FOR DETAILS)

HOT TUB

BENCH

STEEL PLANTERS

SNOW STORAGE (362 SQ. FT.)

SNOW STORAGE (234 SQ. FT.)

SNOW STORAGE (393 SQ. FT.)

HEATED PAVER MOTOR COURT (SEE CIVIL C1.0)

GRASSPAVE FOR OVERFLOW PARKING

(6") HOUSE NUMBERS TO MEET CITY STANDARDS

12'-0" PARKING SPACE

15'-0" SETBACK

NEW ELEC. LINE

NEW UTILITY LINES (SEE CIVIL C1.0)

NEW GAS LINE

PAVER DRIVEWAY ENTRY NOT HEATED WITHIN CITY R-O-W

R-O-W TO BE IRRIGATED W/ SPRAY HEADS PLACED ON PROPERTY LINE OR UNDERGROUND ECO MAT

R-O-W GRAVEL (SEE CIVIL C1.0)

SAGE ROAD

13'-4" SETBACK

145 FEET

142 FEET

GENERAL NOTES:

1. ALL UNDERGROUND UTILITIES SHALL BE LOCATED PRIOR TO START OF CONSTRUCTION.
2. LANDSCAPE BASE MAP INFORMATION TAKEN FROM PREIMINARY SURVEY OF LOT 23, BLOCK 3, WARM SPRINGS SUBDIVISION, 4TH ADDITION, PREPARED BY AIPINE ENTERPRISES INC., KETCHUM, ID 83340, DATED 12/8/2022.
3. CONTRACTOR TO VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO START OF CONSTRUCTION.
4. INFORMATION SHOWN ON THE DRAWINGS IS RELATIVE TO EXISTING CONDITIONS AND ARE BASED ON BEST PRESENT KNOWLEDGE BUT WITHOUT GUARANTEE OF ACCURACY. FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS AND NOTIFY THE LANDSCAPE DESIGNER OF DISCREPANCIES OR CONDITIONS ADVERSELY AFFECTING THE DESIGN INTENT PRIOR TO PROCEEDING WITH WORK.
5. CONTRACTOR TO OBTAIN ALL PERMITS AND APPROVAL AS REQUIRED AND COMPLY WITH RULES AND REGULATIONS OF JURISDICTION GOVERNING THE WORK.
6. THE HOME OWNER AND DESIGNER/CONSULTANT SHALL BE HELD HARMLESS FOR INJURY OR DEATH TO PERSONS OR FOR DAMAGE TO PROPERTY CAUSED BY THE NEGLIGENCE OF THE CONTRACTOR(S), AGENT(S), EMPLOYEE(S), OR SUBCONTRACTOR(S).
7. LANDSCAPE DESIGNER IS HELD HARMLESS FOR LANDSCAPE CONTRACTOR'S WORKMANSHIP.
8. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ADJACENT WORK AND IS TO REPAIR SAID DAMAGE AT CONTRACTOR'S EXPENSE.
9. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING PLANT MATERIALS WHICH ARE TO REMAIN ON SITE. CONTRACTOR SHALL INSTALL A MINIMUM OF 4' TALL TEMPORARY FENCE AT TREE OR SHRUB DRIP LINE AND AROUND EXISTING GARDEN AREAS.
10. ALL DETAILS OF CONSTRUCTION, NOT DEPICTED IN THESE DRAWINGS, INCLUDING, BUT NOT LIMITED TO, GRADING, DRAINAGE, WALLS, HARDSCAPE, SOIL PREPARATION, AND PLANTING ARE THE RESPONSIBILITY OF THE SUBCONTRACTOR.
11. CONTRACTOR TO VERIFY QUANTITIES OF ALL LANDSCAPE MATERIALS NEEDED FOR PROJECT.
12. THIS PLAN WAS PREPARED FOR THE EXPRESS USE OF THE CLIENT AND IS NOT TRANSFERABLE TO OTHERS WITHOUT WRITTEN CONSENT OF THE LANDSCAPE DESIGNER.

DATE 5.30.2023
REVISED

PROJECT # GSD 395.23

SCALE 1/4" = 1'-0"

STATE OF IDAHO · JAMES JACKSON KOEN · 223 · REGISTERED LANDSCAPE ARCHITECT

PRATT RESIDENCE

406 SAGE ROAD, KETCHUM, IDAHO

LANDSCAPE SITE PLAN

PRELIMINARY: ONLY FOR DESIGN REVIEW

PAGE 1 OF 6

garden space design
101 EAST BULLION ST. SUITE 2J
HAILEY, IDAHO
208.720.7210
gardenspacedesigns.com

L - 1.0

EXISTING CONDITIONS KEY

- RED AVALANCHE HAZ. ZONE
- BLUE AVALANCHE HAZ. ZONE
- 25% SLOPE
- MOUNTAIN OVERLAY DIST.
- PROPERTY LINE
- BUILDING ENVELOPE
- EXISTING CONTOUR LINE
- EXISTING FENCE
- EDGE OF ASPHALT

PLANT KEY

(9) EXISTING EVERGREEN TREES TO BE REMOVED

(11) EXISTING DECIDUOUS TREES TO BE REMOVED

LOOKING WEST TO EXISTING HOUSE

LOOKING NORTHEAST TO EXISTING HOUSE

N

DATE	5.30.2023
REVISED	
PROJECT #	GSD 395.23

SCALE	3/16" = 1'-0"

STATE OF IDAHO · JACKSON · LICENSED LANDSCAPE ARCHITECT · 228

PRATT RESIDENCE

406 SAGE ROAD, KETCHUM, IDAHO

EXISTING CONDITIONS

PRELIMINARY: ONLY FOR DESIGN REVIEW

PAGE 2 OF 6

garden space design

101 EAST BULLION ST. SUITE 2J
HAILEY, IDAHO

208.720.7210
gardenspacedesigns.com

L - 1.1

CONSTRUCTION MGMT. KEY

- TIRE CLEAN AREA
- PARKING AREA
- STAGING AREA
- OFFICE TRAILER
- DUMPSTER
- PORTA POTTY
- (4') CONSTRUCTION FENCE LIMIT OF DISTURBANCE
- (2') SLIT FENCE

DUST AND SNOW MITIGATION

1. DUST THAT IS EXPECTED TO BE CREATED AT POTENTIALLY HIGH LEVELS DURING CONSTRUCTION ACTIVITIES WILL BE CONTROLLED BY DAMPENING SOILS WITH SPRINKLED WATER.
2. VEHICLES EXITING THE SITE WILL LEAVE THROUGH A PROPER TIRE CLEAN-OUT, LOCATED AT THE DRIVEWAY ENTRY, TO ENSURE MUD IS NOT TRACKED ONTO THE MAIN ROADWAYS.
3. SNOW TO BE STORED ON SITE AND OUT OF ALL ROADWAYS, CITY RIGHTS-OF-WAY, AND EMS AND PUBLIC ACCESS.
4. IF SNOW QUANTITY DICTATES NECESSITY, SNOW WILL BE REMOVED FROM THE SITE WITH TRUCKS AND TAKEN TO AN APPROVED DUMP LOCATION FOR SNOW REMOVAL.

CONSTRUCTION SCHEDULE

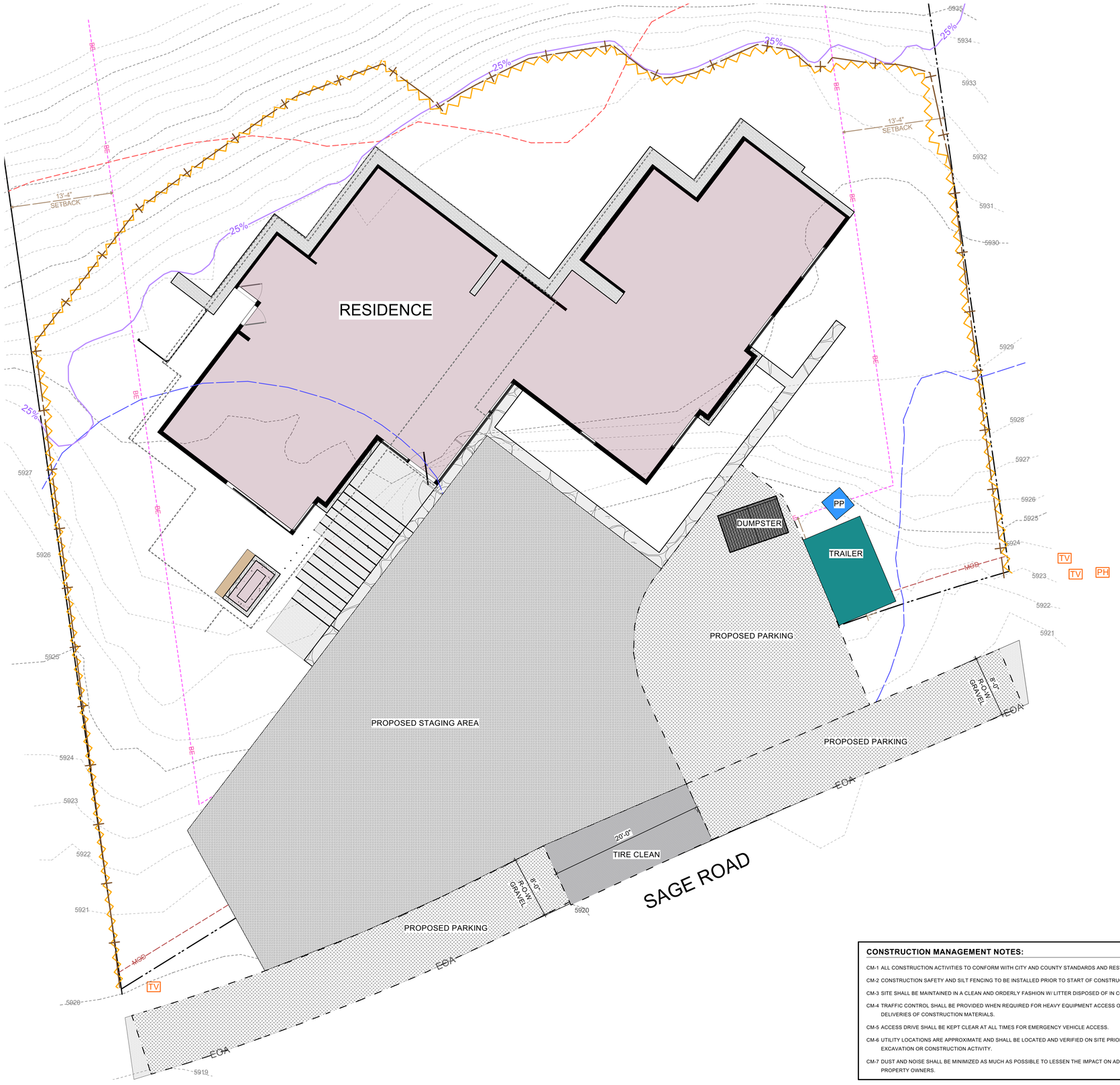
1. CONSTRUCTION SCHEDULE TO LAST TWENTY-FOUR (24) MONTHS.
2. PRIOR TO STARTING CONSTRUCTION, NEIGHBORING PROPERTY OWNERS TO BE NOTIFIED AND PROVIDED CONTACT INFORMATION FOR THE PROJECT MANAGEMENT TEAM MEMBERS IN CASE OF QUESTIONS AND CONCERNS.
3. A FOUR FOOT (4') CONSTRUCTION FENCE AND NECESSARY SILT FENCE WILL BE USED THROUGHOUT THE PROJECT DURATION TO PROTECT NEIGHBORING LOTS FROM CONSTRUCTION DEBRIS.

CUT AND FILL QUANTITIES

1. SOILS REMOVED DURING CONSTRUCTION WILL PREDOMINANTLY STAY WITHIN THE PROJECT BOUNDARIES AND BE REUSED ON SITE.
2. ANY EXCESS MATERIALS WILL BE REMOVED BY TRUCKS AND DUMPED AT APPROVED SITES.
3. CUT AND FILL CALCULATIONS TBD BY CONTRATOR AND PROVIDED TO THE CITY OF KETCHUM PRIOR TO START OF CONSTRUCTION.

SAGE ROAD CONSTRUCTION MANAGEMENT:

SAGE ROAD SHALL ALWAYS BE KEPT FREE AND CLEAR FOR EMERGENCY VEHICLES ACCESS. ANY SIGNIFICANT ACCESS ISSUES SHALL BE BROUGHT TO THE ATTENTION OF THE CITY OF KETCHUM IN ADVANCE. ALL CONSTRUCTION-RELATED VEHICLES AND EQUIPMENT, SUCH AS CRANES, WASTE DUMPSTERS, ETC., SHALL BE LOCATED ENTIRELY ON THE PROJECT SITE (I.E. NOT IN THE ROADWAY OR PUBLIC RIGHT-OF-WAY,) UNLESS GRANTED APPROVAL BY THE CITY OF KETCHUM.



CONSTRUCTION MANAGEMENT NOTES:

CM-1 ALL CONSTRUCTION ACTIVITIES TO CONFORM WITH CITY AND COUNTY STANDARDS AND RESTRICTIONS.

CM-2 CONSTRUCTION SAFETY AND SILT FENCING TO BE INSTALLED PRIOR TO START OF CONSTRUCTION.

CM-3 SITE SHALL BE MAINTAINED IN A CLEAN AND ORDERLY FASHION W/ LITTER DISPOSED OF IN CONTAINERS.

CM-4 TRAFFIC CONTROL SHALL BE PROVIDED WHEN REQUIRED FOR HEAVY EQUIPMENT ACCESS OR FOR DELIVERIES OF CONSTRUCTION MATERIALS.

CM-5 ACCESS DRIVE SHALL BE KEPT CLEAR AT ALL TIMES FOR EMERGENCY VEHICLE ACCESS.

CM-6 UTILITY LOCATIONS ARE APPROXIMATE AND SHALL BE LOCATED AND VERIFIED ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION ACTIVITY.

CM-7 DUST AND NOISE SHALL BE MINIMIZED AS MUCH AS POSSIBLE TO LESSEN THE IMPACT ON ADJACENT PROPERTY OWNERS.

N

DATE 5.30.2023
REVISED

PROJECT # GSD 395.23

SCALE 3/16" = 1'-0"

STATE OF IDAHO — JARED A. TATT — LA 228 — LICENSED LANDSCAPE ARCHITECT

PRATT RESIDENCE

406 SAGE ROAD, KETCHUM, IDAHO

CONSTRUCTION MANAGEMENT PLAN

PRELIMINARY: ONLY FOR DESIGN REVIEW

PAGE 3 OF 6

garden space design
101 EAST BULLION ST. SUITE 2J
HAILEY, IDAHO
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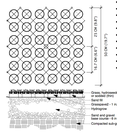
GRASSPAVE²

BY INVISIBLE STRUCTURES™

100% Grass Covered Porous Pavement

Grasspave2 Flexible Plastic Porous Pavement

Grasspave2 protects and enhances the environment in three ways: First, made from 100% recycled plastic, Grasspave2 keeps common consumer and industrial products from going into landfills. Second, grass paving directly improves the environment by recharging water tables and filtering pollutants (and runoff downstream), reducing sources of oils and solvents from asphalt, absorbing carbon dioxide, and creating oxygen. Third, it enhances the beauty and quality of the built environment – replacing hot asphalt paved areas with cool, sparkling green lawn-like Product Description



Grasspave2 has thin-walled independent plastic rings connected by an interlocking gengrid structure, which, because it is installed below the surface, is invisible in the completed project. While the rings are rigid, the grid itself is flexible, which makes it easy to install on uneven grades, and reduces usual cut and fill requirements.

The rings transfer loads from the surface to the grid structure and engineered base course material below, thus preventing compaction of the upper root zone of the grass. A single ring supports small loads, such as shoes; several rings support tires and large loads.

The rings also act to contain the root zone medium (sand) and prevent lateral migration away from tires, feet, or other loads. This protects the grass root system, enabling roots to grow deep into the porous base course. The result is healthy, green turf at the surface.

One person can easily install the Grasspave2 rolls at a rate of 30sq ft (2700 ft2) per hour, plus time for base course preparation and grass installation (seeding, sod or sprigging). Step-by-step instructions are included in our Installation Instructions, which accompany each order.

Features and Benefits

- Allows 100% grass coverage instead of asphalt
- Made from 100% post consumer plastic
- High strength to weight load-bearing capacity
- Supports vehicular and pedestrian traffic
- Maximum porosity
- Low to zero runoff
- Free air/water movement
- Permits more trees
- Cooler site
- Greater oxygen
- Removes air pollutants
- Can preserve existing trees
- Helps to meet "Green Coverage Codes"
- Fast, low cost installation
- Competes in cost with asphalt paving
- No gutter or drain system needed
- No added land required for detention facilities
- Lower life cycle costs

Applications

- Church/employee parking
- Overflow and event parking
- Golf cart paths
- Residential driveways
- Firelanes

Specifications

Unit Size – 20"x 20"x 1" (50 x 50 x 2.5cm)
Unit Weight – 1lbs (.510 grams)
Strength – 15,940 psi (109,906 kPa)
Connector Pull Apart Strength (Tensile) - 458 lbf/in
Color – Black
Resin – 100% recycled HDPE with 3% carbon black
Shipped in Rolls (431 sq ft standard, other roll sizes available)
92% Void Space (8% plastic by volume)

Invisible Structures, Inc.
303-233-8383
www.invisiblestructures.com
US Patent #5,250,340

INVISIBLE STRUCTURES

DIAMOND SPAS POOLS

THE MONARCH PORTABLE SPA
ABOVE GROUND WITH AUTOCOVER
SPECIFICATIONS

FEATURES:
- STAINLESS STEEL OR COPPER CONSTRUCTION
- 101" X 101" X 39"
- REMOVABLE ACCESS PANELS ARE AVAILABLE IN STAINLESS STEEL OR COPPER
- 5-6 BATHER CAPACITY
- LED LIGHTING
- 14 HYDROTHERAPY JETS
- FULLY INSULATED

CERTIFICATIONS:
STAINLESS STEEL SHELLS ONLY:
- CERTIFIED TO MEET CEC APPLIANCE EFFICIENCY STANDARDS FOR PORTABLE ELECTRIC SPAS
- CERTIFIED TO MEET ANSI/APSP-14 STANDARD FOR PORTABLE SPA ENERGY EFFICIENCY

STAINLESS STEEL & COPPER SHELLS:
- ETL LISTED AND LISTING FOR UL 1795 AND CSA C22.2 STANDARDS
- NOTE: DIMENSIONS, DESIGN AND EQUIPMENT CANNOT BE MODIFIED.

NOTES 50A CONTROL:
- SPA REQUIRES (1) 2 30V 50A GFCI SERVICE EQUIPMENT FOR CONTROL AND HEATER
- SPA SHELL AND ALL EQUIPMENT TO BE BONDED W/ MIN. #8AWG BARE COPPER CONDUCTOR

1.800.951.SPAS (7727) 720.864.9115 FAX 866.605.2358 DIAMONDSPAS.COM INFO@DIAMONDSPAS.COM

IKON OUTDOOR STEP LIGHT

TECH LIGHTING

The Ikon outdoor step light features a minimized rectangular aperture that aims illumination downward to light stairs with minimal glare. Ideal for way-finding and added safety after dark. Available in two finishes, Black and Bronze.

- **Selectable CCT** (3000K) 3000K
- **120V or 12V**
- **Outstanding protection against the elements:**
  - Wet Listed IP66 Rated
  - Stainless Steel Mounting Hardware
  - Powder Coat Finishes

IKON OUTDOOR WALL/STEP LIGHT
Shown in Stock

IKON OUTDOOR WALL/STEP LIGHT
Shown in Bronze

SPECIFICATIONS

DELIVERED LUMENS	260 (@700K)
WATTS	12.2
VOLTAGE	12V (Transformer sold separately) or 120V
DIMMING	12V ELV, MLV and Triac, 120V not dimmable
LIGHT DISTRIBUTION	Symmetric
OPTICS	Not applicable
MOUNTING OPTIONS	Step: 2x4 junction box
CCT	2700K (3000K Selectable)
CRI	90+
COLOR BINNING	3 Step
BUG RATING	B1-U2-G1
DARK SKY	Compliant
WET LISTED	IP66
GENERAL LISTING	ETL
CALIFORNIA TITLE 24	Can be used to comply with CEC 2019 Title 24 Part 6 for outdoor use. Registration with CEC Appliance Database not required.
START TEMP	-30°C
FIELD SERVICEABLE LED	No
CONSTRUCTION	Aluminum
HARDWARE	Stainless Steel
FINISH	Powder Coat
LED LIFETIME	L70, >60,000 Hours
WARRANTY *	5 Years
WEIGHT	1 lb.

* Visit techlighting.com for specific warranty limitations and details.

ORDERING INFORMATION

PRODUCT	CRI/CCT	FINISH	VOLTAGE
FIXTURE/LAMP	90 CRI 2700K/3000K	B BLACK	12V 12V
	2 2700K/3000K	Z BRONZE	120V 120V

INSTALLATION INFORMATION

12V AC TRANSFORMERS*
LOW VOLTAGE, ELECTRONIC

ITEM	DESCRIPTION	HOUSING	DIMMING
700ETCMT	MAGNETIC, 75VA, 12V	STAINLESS STEEL	MAGNETIC
700ETCMTEST	MAGNETIC, 300VA, 120V	STAINLESS STEEL	MAGNETIC

* Transformers are sold separately. Please refer to the Tech Lighting Low Voltage Transformer Guide for more information. Lighting effects may vary due to transformer and 12V wire run. Consult Tech Lighting Transformer Guide for more information.

* Not recommended for use with LED lighting. Please refer to the Tech Lighting Low Voltage Transformer Guide for more information.

techlighting.com

12V Two Arm Path Light with LED Lamp

15844

PROJECT: ORDERING:
TYPE: COMMENTS:

OVERVIEW
The Double-Arm path light has a clean, modern design that creates a shadow pattern behind it. This fixture combines clean and modern design with robust and durable construction.

FEATURES
- Thick, robust cast construction
- Textured diffusion lens for glare control and uniform light spread
- No visible seams or screws
- Optimized socket location, easy to lamp

SPECIFICATIONS

Fixture/Housing

Height	23" / 559mm
Length	6.00" / 153 mm
Width	3.00" / 77 mm
Housing Material	Cast Aluminum or Cast Brass
Weight Alum	3.40 lbs / 1.54 kg

Lamp-Base

Lamp Base	12V T5 Wedge

Electrical

Input Voltage Range	9-15V AC/DC
Max Wattage	11.5W

Wire

36" HT usable #18-2, SPT-1W leads

Ratings/Certification

Wet Locations

FIXTURE

Glass Lens

Satin Etched Polycarbonate diffusion lens for even light dispersion and glare control

Included Accessories

15276 BK - Power Post*
15065 - Surface Mounting Flange (needed for of attachments to junction box)

Notes

Fixtures include an 8" in-ground slotted stake (Cast Brass fixtures and Textured Bollard include a 14" stake) and gel-filled cable connectors. Lamps sold separately.

AVAILABLE FINISHES

AT Architectural Bronze	BKT Textured Black	CBR Centennial Brass

12V Two Arm Path Light with LED Lamp

15844

DIMENSIONS

PHOTOMETRICS*

Distance from Light	0"	1"	2"	3"	4"	5"	6"	7"	8"
Footcandles*	9.3	5.2	1.5	0.6	0.2	0.1	0.05	0.03	0.01

* Values stated for supplied lamp with fixture

RECOMMENDED LED LAMPS* (sold separately)

18122	1.5W, 2.4VA, 2700K, 130 lumens, 120° Beam
18121	**1.5W, 2.4VA, 3000K, 130 lumens, 120° Beam**
15166	1.5W, 12VA, 2700K, 85 lumens, 180° Beam
18199	1.1W, 1.2VA, 3000K, 85 lumens, 180° Beam
18204	2.3W, 3.3VA, 2700K, 215 lumens, 300° Beam
18205	2.3W, 3.3VA, 3000K, 215 lumens, 300° Beam

* Power usage at 12V AC Input

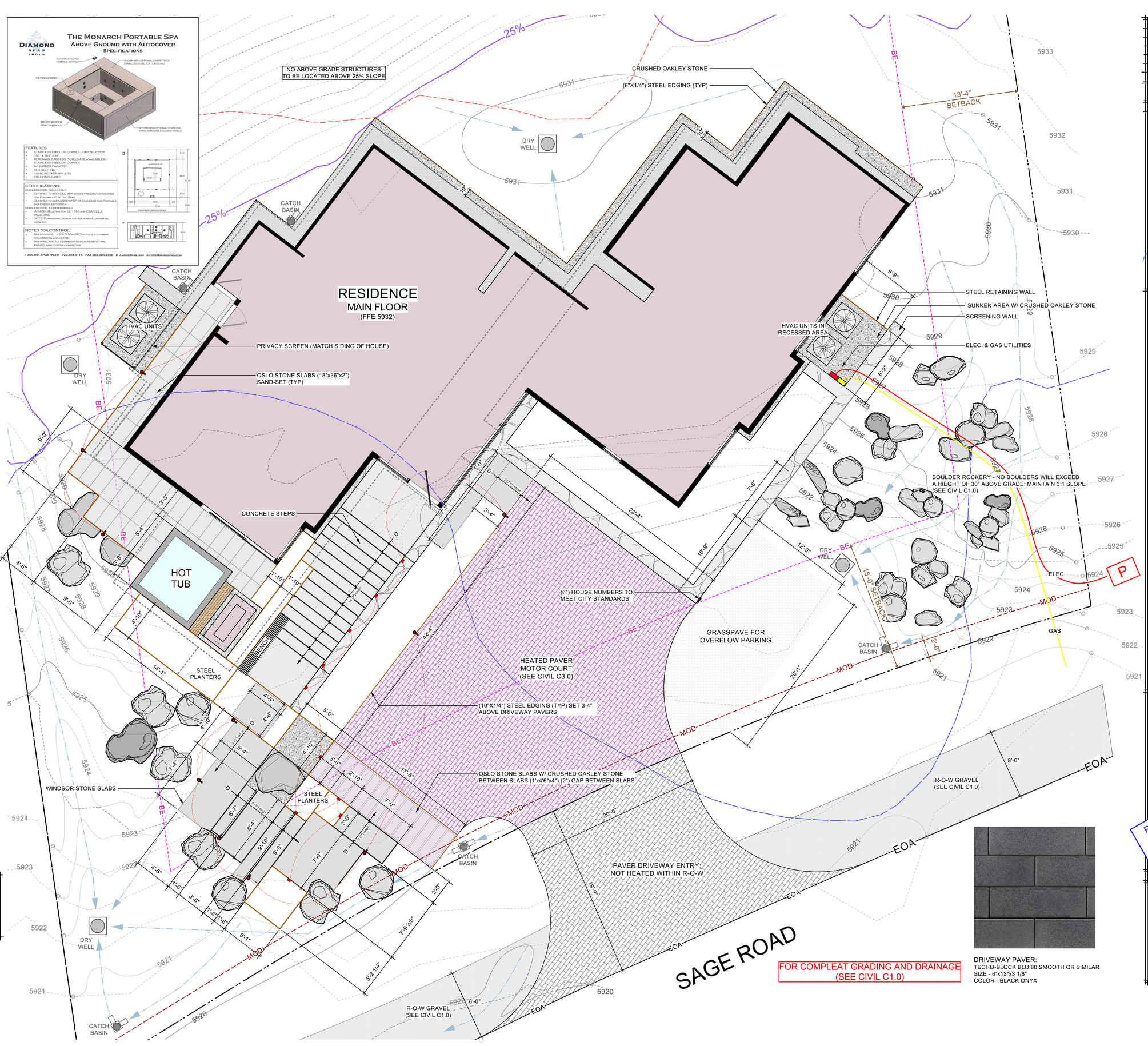
INSTALLATION INFORMATION

Power (W)	Wire Gauge / Length / (ft/m) Load Chart			
	16	14	12	10
0-35	180/367	1150/351	1830/558	4000/1219
40	150/283	980/297	1550/472	2350/716
60	620/189	990/196	240/73	700/46
80	470/143	240/68	180/55	150/46
100	370/113	230/70	140/43	90/27
>100	Consult Technical Support			

LANDSCAPE LIGHTING KEY

10		PATH LIGHT - KICHLER TWO ARM PATH LIGHT
10		STEP LIGHT - ICON HORIZONTAL STEP LIGHT

NOTE: ALL LIGHT FIXTURES TO BE COMPLIANT WITH LOCAL DARK SKY PRESERVATION ORDINANCES



DRIVEWAY PAVER:
TECHO-BLOCK BLU 80 SMOOTH OR SIMILAR
SIZE - 6"x13"x3 1/8"
COLOR - BLACK ONYX

DATE	5.30.2023
REVISED	
PROJECT #	GSD 395.23

SCALE	1/4" = 1'-0"

STATE OF IDAHO — JASON JACKSON HOYER — LICENSED LANDSCAPE ARCHITECT — 223

PRELIMINARY: ONLY FOR DESIGN REVIEW

PRATT RESIDENCE
406 SAGE ROAD, KETCHUM, IDAHO

HARDSCAPE DIMENSION PLAN

PAGE 4 OF 6

garden space design
101 EAST BULLION ST. SUITE 2J
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PLANT SCHEDULE

NOTES: B&B=BALL & BURLAP; D.T.=DROUGHT TOLERANT; N.=NATIVE; X.=XERIC

QTY.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
5	ACER RUBRUM 'ARMSTRONG'	COLUMNAR ARMSTRONG MAPLE	3.5"-4" CAL	B & B
2	CELTIS OCCIDENTALIS	COMMON HACKBERRY	2 1/2" CAL	B & B; D.T.; N.; XX.
3	CRATAEGUS AMBIGUA	RUSSIAN HAWTHORN	12'-14' MULTI-STEM	B & B; D.T.; XX.
CONIFERS				
4	PICEA GLAUCA 'DENSATA'	BLACK HILLS SPRUCE	12'-14'	B & B; D.T.; XX.
2	PINUS ARISTATA'	BRISTLECONE PINE	8'-10'	B & B; D.T.; N.; X.
SHRUBS				
2	AMELANCHIER ALNIFOLIA	SASKATOON SERVICEBERRY	8-10' MULTI-STEM	B & B; D.T.; N.; X.
8	ARONIA MELANOCARPA	BLACK CHOKEBERRY	5'-6'	D.T.; N.; X.
20	PHILADELPHUS 'SNOWBELLE'	DWARF MOCK ORANGE	5 GAL	D.T.; N.; X
16	POTENTILLA FRUTICOSA 'GOLDFINGER'	GOLDFINGER POTENTILLA	5 GAL	D.T.; N.; XX.
11	PRUNUS BESSEYI 'PAWNEE BUTTES'	CREEPING WESTERN CHERRY	5 GAL	D.T.; N.; XX.
5	RHUS TYPHINA 'BAILTIGER'	TIGER-EYE SUMAC	10 GAL	D.T.; N.; XX.
6	RIBES AUREUM	GOLDEN CURRANT	10 GAL	D.T.; N.; X.
GRASSES				
81	DESCHAPSIA CESPITOSA	TUFTED HAIR GRASS	1 GAL	D.T.; N.; X.
138	FESTUCA IDAHOENSIS 'MEDIUM GREEN'	MEDIUM GREEN FESCUE	1 GAL	NATIVE ROOTS
23	SCHIZACHYRIUM SCOPARIUM 'PRAIRIE BLUES'	THE BLUES PRAIRIE GRASS	1 GAL	D.T.; N.; XX.
PERENNIALS / GROUNDCOVERS				
15	EQUISETUM SPP.	HORSETAIL RUSH	1 GAL	
300	MISCELLANEOUS PERENNIALS	MISCELLANEOUS PERENNIALS	1 GAL	
90	SEDUM SPURIUM FULAGLUT	CREEPING SEDUM	4" CUPS	10" O.C.
VINES				
4	CLEMATIS X 'JACKMANI'	JACKMANI CLEMATIS	5 GAL	
5	CLEMATIS X 'MADAME LE COULTE'	MADAME LE COULTE CLEMATIS	5 GAL	
3	LONICERA X BROWNII 'DROPMORE SCARLET'	DROPMORE SCARLET HONEYSUCKLE	5 GAL	D.T.; X.

SAGE GRASS MIX

25% Pseudoroegneria spicata	BLUEBUNCH WHEATGRASS
25% Festuca idahoensis	IDAHO FESCUE
15% Elymus trachycaulas	SLENDER WHEATGRASS
10% Achnatherum hymenoides	INDIAN RICEGRASS
10% Pascopyrum smithii	WESTERN WHEATGRASS
5% Elymus lanceolatus	THICKSPIKE WHEATGRASS
5% Lomatium triternatum	NINELEAF BISCUITROOT
5% Poe secunda	SANDBERG'S BLUEGRASS
5% Elymus elymoides	BOTTLEBRUSH SQUIRRELTAIL

(SOURCE: WESTERN NATIVE SEED)

*** **SEEDING RATE**: 2 lbs per 1,000 sq.ft. or 25 lbs per acre

PLUG RATE: 18" O.C. = .45 plants per sq.ft.

SAGE COUNTRY WILDFLOWER MIX

15% Balsamorhiza sagittata	ARROWLEAF BALSAMROOT
12% Eriogonum umbellatum	SULFURFLOWER BUCKWHEAT
10% Cleome serrulata	ROCKY MOUNTAIN BEEPLANT
10% Linum perenne lewisii	BLUEFLAX
10% Penstemon eatonii	FIRECRACKER PENSTEMON
10% Penstemon strictus	ROCKY MT. PENSTEMON
5% Eriogonum heracleoides	WYETH BUCKWHEAT
5% Lomatium triternatum	NINELEAF BISCUITROOT
5% Penstemun speciosus	SAGE PENSTEMON
3% Penstemon wilcoxii	WILCOX PENSTEMON
2% Achillea millefolium occidentalis	ROCKY MT. PENSTEMON
2% Heliomeris multflora	SHOWY GOLDENEYE
1% Sphaeralcea munroana	MUNRO GLOBEMALLOW

(SOURCE: WESTERN NATIVE SEED)

*** **SEEDING RATE**: 8oz. per 1,000 sq. ft.

IRRIGATION CALCULATIONS

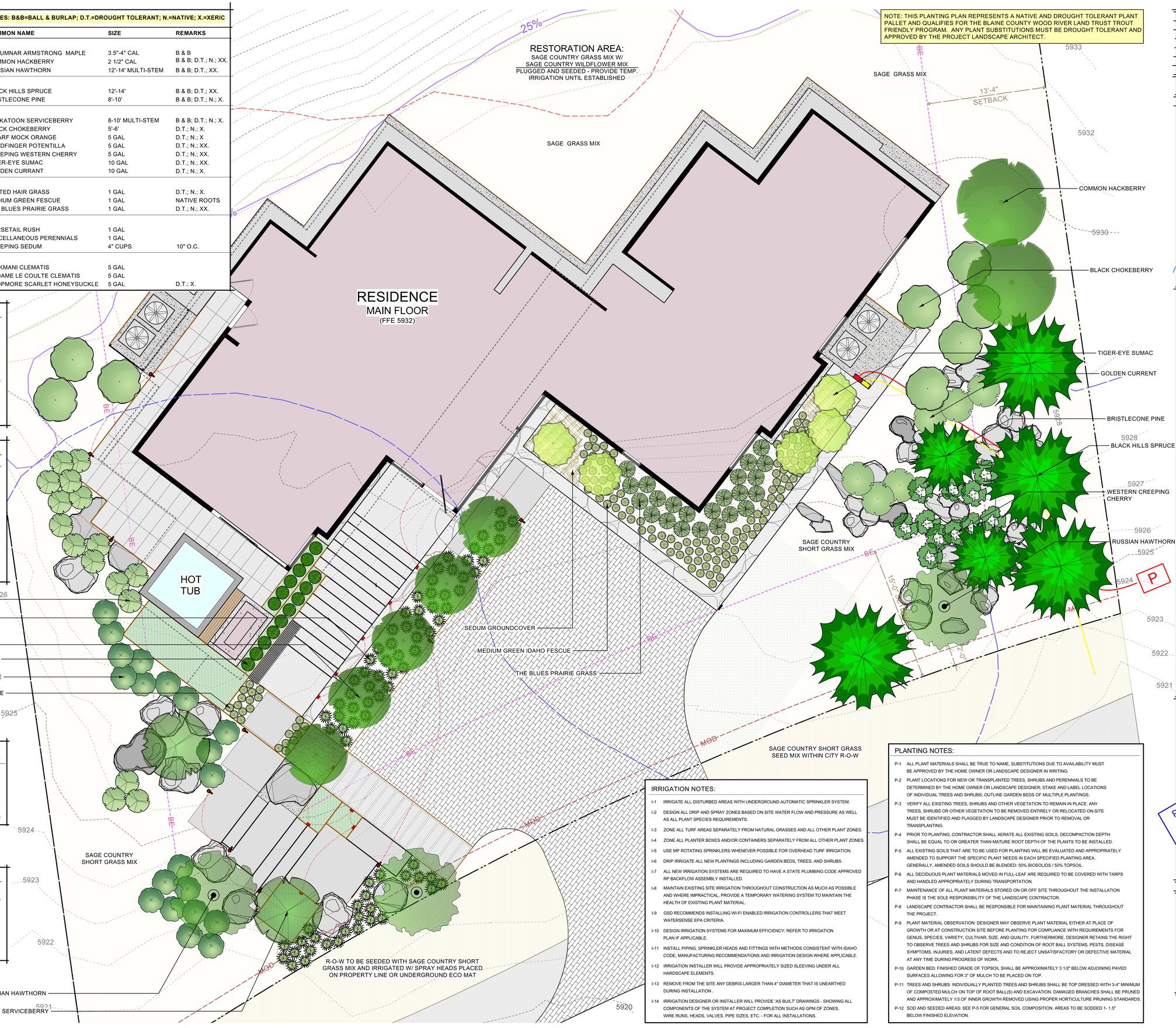
TOTAL LOT ACREAGE =	3.13 ACRES† =136,443 SQ.FT.†
IRRIGATED AREAS:	
NATIVE GRASS AREAS (IRRIGATED)	4,285 SQ.FT.
R.O.W. NATIVE GRASS AREA (IRRIGATED)	1,042 SQ.FT.
MULCHED PLANTING BEDS	492 SQ.FT.
RAISED STEEL PLANTERS	138 SQ.FT.
TOTAL IRRIGATED AREAS:	.14 ACRES† =5,957 SQ.FT.†

SAGE COUNTRY SHORT GRASS MIX

25% Achnatherum hymenoides	INDIAN RICEGRASS
20% Elymus elymoides	BOTTLEBRUSH SQUIRRELTAIL
5% Koeleria macrantha	JUNEGRASS
5% Poa fendleriana	MUTTONGRASS
45% Poa secunda	SANDBERG'S BLUEGRASS

(SOURCE: WESTERN NATIVE SEED)

*** **SEEDING RATE**: 1 lb per 1,000 sq. ft. or 25 lbs. per acre



IRRIGATION NOTES:

- I-1 IRRIGATE ALL DISTURBED AREAS WITH UNDERGROUND AUTOMATIC SPRINKLER SYSTEM.
- I-2 DESIGN ALL DRIP AND SPRAY ZONES BASED ON SITE WATER FLOW AND PRESSURE AS WELL AS ALL PLANT SPECIES REQUIREMENTS.
- I-3 ZONE ALL TURF AREAS SEPARATELY FROM NATURAL GRASSES AND ALL OTHER PLANT ZONES.
- I-4 ZONE ALL PLANTER BOXES AND/OR CONTAINERS SEPARATELY FROM ALL OTHER PLANT ZONES.
- I-5 USE MP ROTATING SPRINKLERS WHENEVER POSSIBLE FOR OVERHEAD TURF IRRIGATION.
- I-6 DRIP IRRIGATE ALL NEW PLANTINGS INCLUDING GARDEN BEDS, TREES, AND SHRUBS.
- I-7 ALL NEW IRRIGATION SYSTEMS ARE REQUIRED TO HAVE A STATE PLUMBING CODE APPROVED RP BACKFLOW ASSEMBLY INSTALLED.
- I-8 MAINTAIN EXISTING SITE IRRIGATION THROUGHOUT CONSTRUCTION AS MUCH AS POSSIBLE AND WHERE IMPRACTICAL, PROVIDE A TEMPORARY WATERING SYSTEM TO MAINTAIN THE HEALTH OF EXISTING PLANT MATERIAL.
- I-9 GSD RECOMMENDS INSTALLING WI-FI ENABLED IRRIGATION CONTROLLERS THAT MEET WATERSENSE EPA CRITERIA.
- I-10 DESIGN IRRIGATION SYSTEMS FOR MAXIMUM EFFICIENCY; REFER TO IRRIGATION PLAN IF APPLICABLE.
- I-11 INSTALL PIPING, SPRINKLER HEADS AND FITTINGS WITH METHODS CONSISTENT WITH IDAHO CODE, MANUFACTURING RECOMMENDATIONS AND IRRIGATION DESIGN WHERE APPLICABLE.
- I-12 IRRIGATION INSTALLER WILL PROVIDE APPROPRIATELY SIZED SLEEVING UNDER ALL HARDSCAPE ELEMENTS.
- I-13 REMOVE FROM THE SITE ANY DEBRIS LARGER THAN 4" DIAMETER THAT IS UNEARTHED DURING INSTALLATION .
- I-14 IRRIGATION DESIGNER OR INSTALLER WILL PROVIDE 'AS BUILT' DRAWINGS - SHOWING ALL COMPONENTS OF THE SYSTEM AT PROJECT COMPLETION SUCH AS GPM OF ZONES, WIRE RUNS, HEADS, VALVES, PIPE SIZES, ETC. - FOR ALL INSTALLATIONS.

PLANTING NOTES:

- P-1 ALL PLANT MATERIALS SHALL BE TRUE TO NAME, SUBSTITUTIONS DUE TO AVAILABILITY MUST BE APPROVED BY THE HOME OWNER OR LANDSCAPE DESIGNER IN WRITING.
- P-2 PLANT LOCATIONS FOR NEW OR TRANSPLANTED TREES, SHRUBS AND PERENNIALS TO BE DETERMINED BY THE HOME OWNER OR LANDSCAPE DESIGNER; STAKE AND LABEL LOCATIONS OF INDIVIDUAL TREES AND SHRUBS; OUTLINE GARDEN BEDS OF MULTIPLE PLANTINGS.
- P-3 VERIFY ALL EXISTING TREES, SHRUBS AND OTHER VEGETATION TO REMAIN IN PLACE. ANY TREES, SHRUBS OR OTHER VEGETATION TO BE REMOVED ENTIRELY OR RELOCATED ON-SITE MUST BE IDENTIFIED AND FLAGGED BY LANDSCAPE DESIGNER PRIOR TO REMOVAL OR TRANSPLANTING.
- P-4 PRIOR TO PLANTING, CONTRACTOR SHALL AERATE ALL EXISTING SOILS. DECOMPACTION DEPTH SHALL BE EQUAL TO OR GREATER THAN MATURE ROOT DEPTH OF THE PLANTS TO BE INSTALLED.
- P-5 ALL EXISTING SOILS THAT ARE TO BE USED FOR PLANTING WILL BE EVALUATED AND APPROPRIATELY AMENDED TO SUPPORT THE SPECIFIC PLANT NEEDS IN EACH SPECIFIED PLANTING AREA. GENERALLY, AMENDED SOILS SHOULD BE BLENDED: 50% BIOSOLIDS / 50% TOPSOIL.
- P-6 ALL DECIDUOUS PLANT MATERIALS MOVED IN FULL-LEAF ARE REQUIRED TO BE COVERED WITH TARPS AND HANDLED APPROPRIATELY DURING TRANSPORTATION.
- P-7 MAINTENANCE OF ALL PLANT MATERIALS STORED ON OR OFF SITE THROUGHOUT THE INSTALLATION PHASE IS THE SOLE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR.
- P-8 LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING PLANT MATERIAL THROUGHOUT THE PROJECT.
- P-9 PLANT MATERIAL OBSERVATION: DESIGNER MAY OBSERVE PLANT MATERIAL EITHER AT PLACE OF GROWTH OR AT CONSTRUCTION SITE BEFORE PLANTING FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, CULTIVAR, SIZE, AND QUALITY. FURTHERMORE, DESIGNER RETAINS THE RIGHT TO OBSERVE TREES AND SHRUBS FOR SIZE AND CONDITION OF ROOT BALL SYSTEMS, PESTS, DISEASE SYMPTOMS, INJURIES, AND LATENT DEFECTS AND TO REJECT UNSATISFACTORY OR DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK.
- P-10 GARDEN BED: FINISHED GRADE OF TOPSOIL SHALL BE APPROXIMATELY 3 1/2" BELOW ADJOINING PAVED SURFACES ALLOWING FOR 3" OF MULCH TO BE PLACED ON TOP.
- P-11 TREES AND SHRUBS: INDIVIDUALLY PLANTED TREES AND SHRUBS SHALL BE TOP DRESSED WITH 3-4" MINIMUM OF COMPOSTED MULCH ON TOP OF ROOT BALL(S) AND EXCAVATION. DAMAGED BRANCHES SHALL BE PRUNED AND APPROXIMATELY 1/3 OF INNER GROWTH REMOVED USING PROPER HORTICULTURE PRUNING STANDARDS.
- P-12 SOD AND SEEDED AREAS: SEE P-5 FOR GENERAL SOIL COMPOSITION. AREAS TO BE SODDED 1- 1.5" BELOW FINISHED ELEVATION.

DATE	5.30.2023
REVISED	
PROJECT #	GSD 395.23

SCALE	1/4" = 1'-0"

STATE OF IDAHO · JACKSON · OREGON · LICENSED · LANDSCAPE ARCHITECT · 228

PRATT RESIDENCE

406 SAGE ROAD, KETCHUM, IDAHO

PLANTING PLAN

PRELIMINARY: ONLY FOR DESIGN REVIEW

PAGE 5 OF 6

garden space design
101 EAST BULLION ST. SUITE 2J
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L - 3.0

ARMSTRONG MAPLE

TIGER-EYE SUMAC

COMMON HACKBERRY

SASKATOON SERVICEBERRY

BLACK CHOKEBERRY

BLACK HILLS SPRUCE

IDAHO FESCUE

BRISTLECONE PINE

HONEYSUCKLE VINE

CLEMATIS SPP.

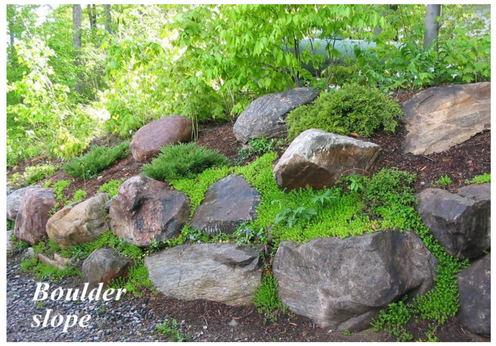
WESTERN CREEPING CHERRY

HORSETAIL REED GRASS

GOLDEN CURRENT

DWARF MOCK ORANGE

GOLDFINGER POTENTILLA



BOULDER / PLANT SLOPE RETENTION

RUSSIAN HAWTHORN

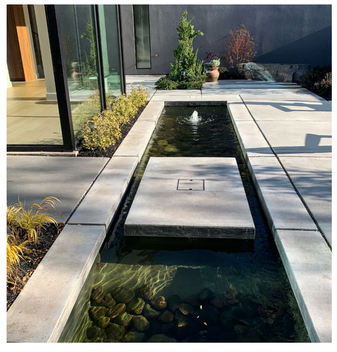
TUFTED HAIR GRASS

SEDUM SPP.

SAGE COUNTRY SEED MIX

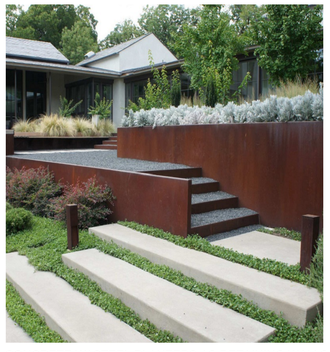
SAGE COUNTRY MIX

THE BLUES PRAIRIE GRASS



WALKWAY OVER WATER

NATURAL GRASS ROOF



CONCRETE W/ STEEL PLANTERS AS RETAINING WALLS

STEEL PLANTERS W/ CONCRETE STEPS

HORSETAIL W/ MOVING WATER

DATE 5.30.2023
REVISED

PROJECT # GSD 395.23

SCALE NO SCALE

STATE OF IDAHO
REGISTERED
LICENSED
LANDSCAPE ARCHITECT
ISLA 228

PRATT RESIDENCE

406 SAGE ROAD, KETCHUM, IDAHO

INSPIRATIONAL & PLANT PHOTOS

PRELIMINARY: ONLY FOR DESIGN REVIEW

PAGE 6 OF 6

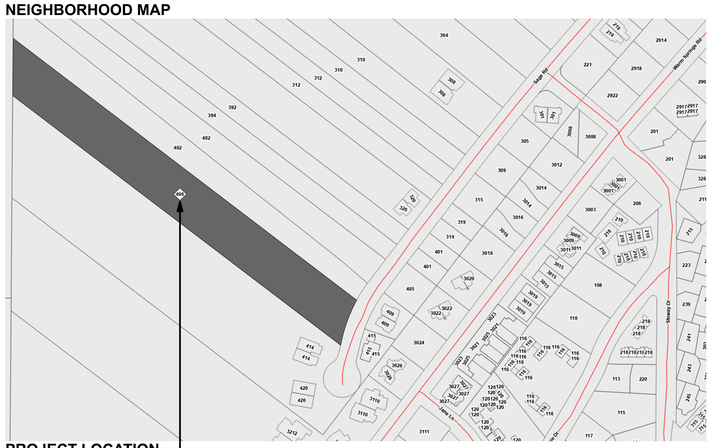
garden space design

101 EAST BULLION ST. SUITE 2J
HAILEY, IDAHO

208.720.7210
gardenspacedesigns.com

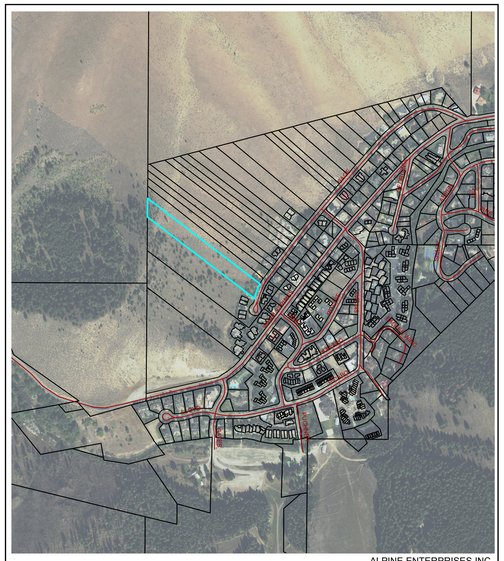
L - 4.0

NEIGHBORHOOD MAP



PROJECT LOCATION
406 Sage Rd, Ketchum, ID. 83340

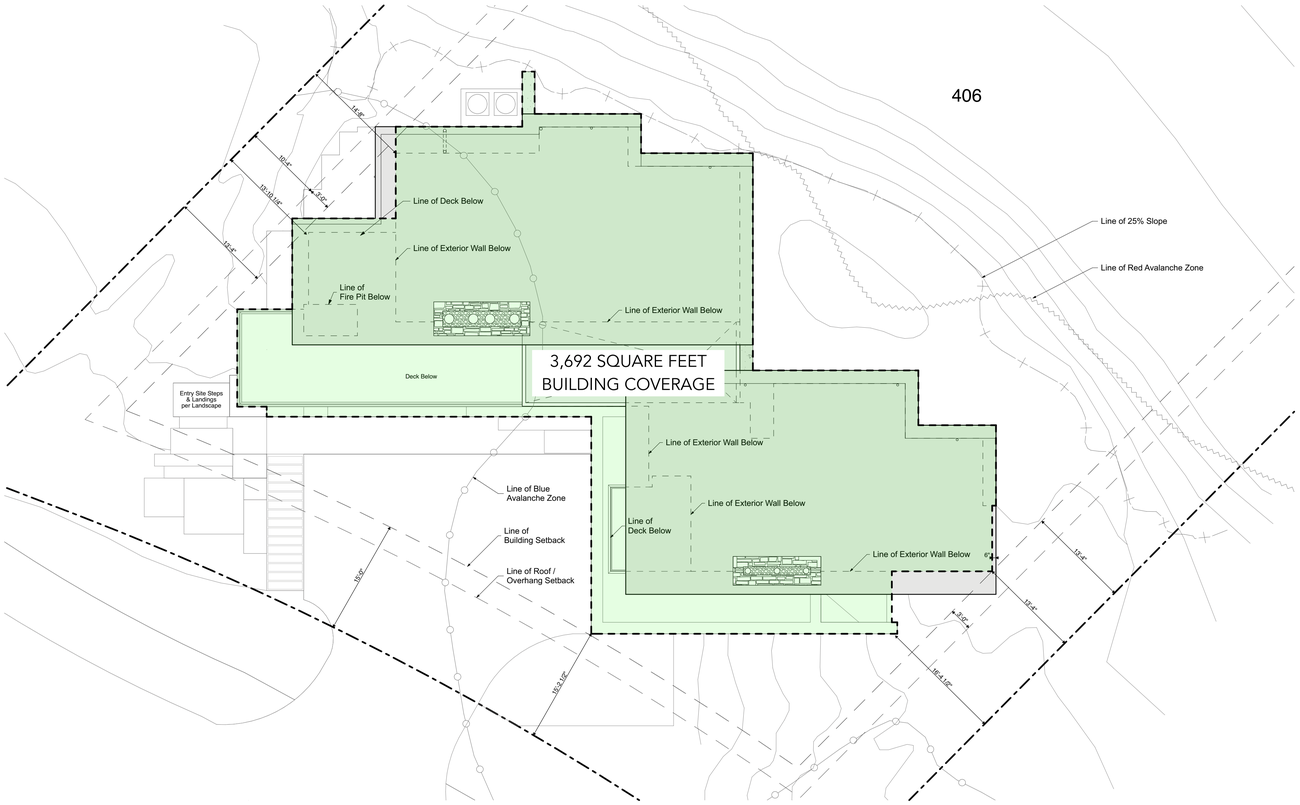
FIRE SAFETY GENERAL NO



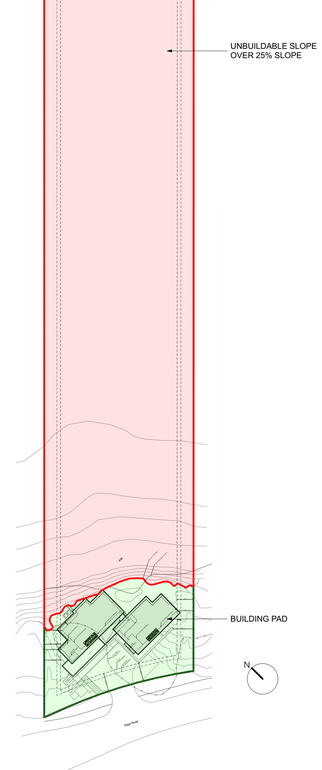
A Vicinity Map Showing
Lot 23, Block 3
Warm Springs Village Subdivision, 4th Addition
Ketchum, Idaho

1 inch = 500 feet

ALPINE ENTERPRISES INC.
PO Box 2037
660 Bell Drive, Unit1
Ketchum, Idaho
208-727-1988
January 2023



BUILDING COVERAGE OVERLAY DIAGRAM
SCALE: 1/8" = 1'-0"



SITE EXTENTS AND BUILDING PAD DIAGRAM
1"=50'

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Jackson Hole
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Louisiana
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T.318.383.3100

ARCHITECT STAMP

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ARCHITECT
AR 986479
5/31/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM
ID 83340

DATE:	5/31/23
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A200A

CONTEXT DIAGRAMS

N

SITE PLAN
SCALE: 1/8" = 1'-0"

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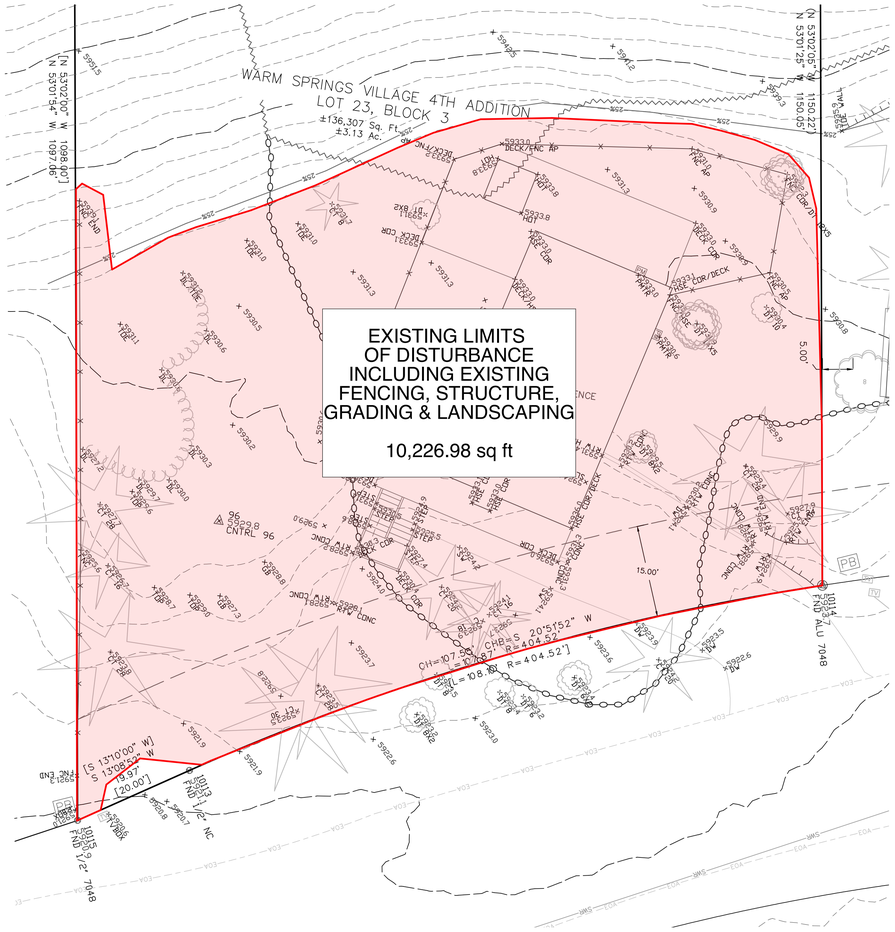
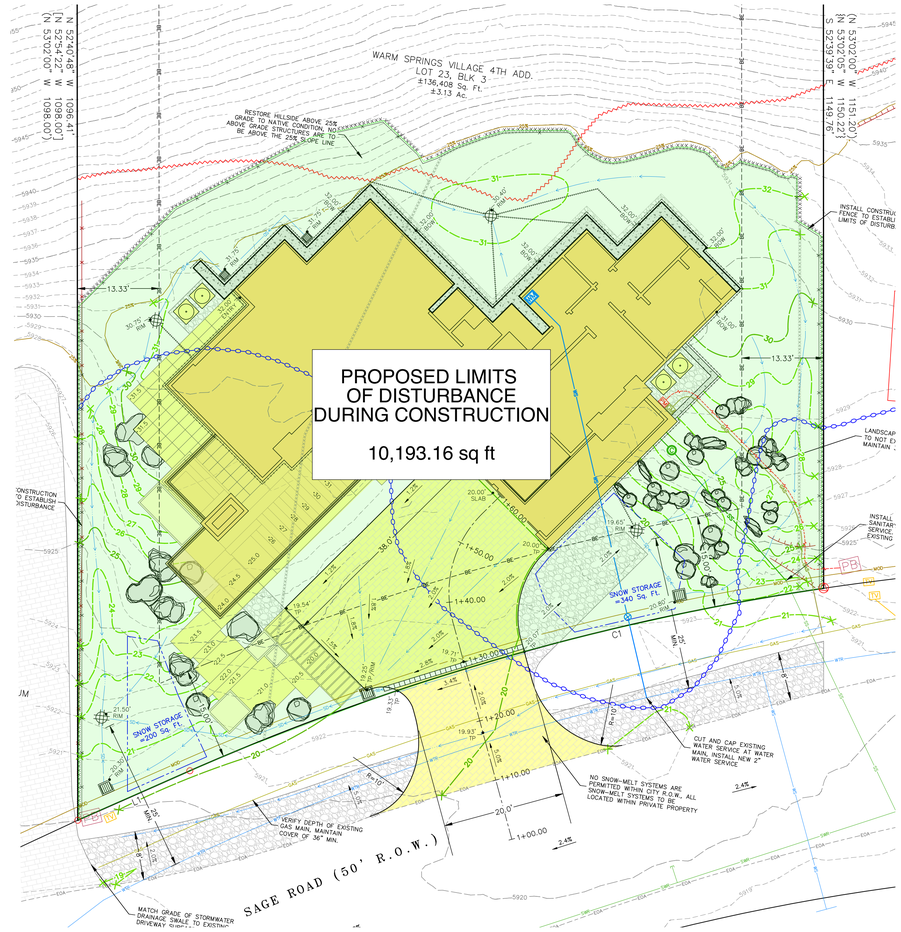
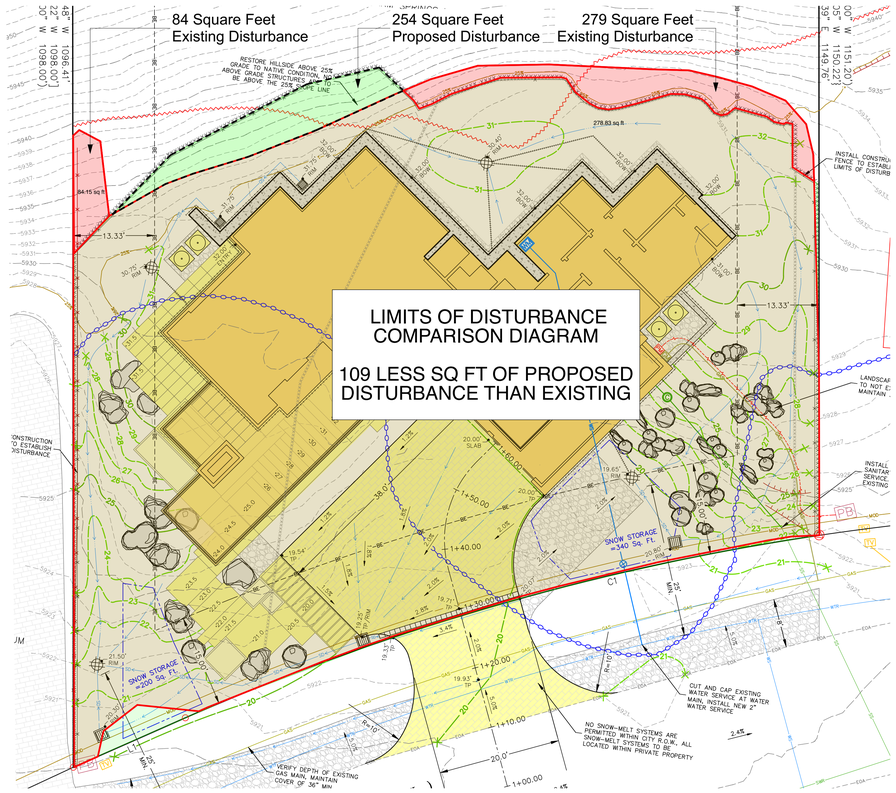
A200B
ARCHITECTURAL SITE PLAN

vs



SITE DISTURBANCE DIAGRAMS
SCALE: 1" = 10'





LOD COMPARISON DIAGRAM
SCALE: 1" = 10'

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A200C
SITE DISTURBANCE DIAGRAMS

V5

GENERAL PLAN NOTES

01. Do not scale drawings. Contact Architect for any undocumented dimensions or clarification of any dimensional discrepancies. Large scale drawings take precedence over smaller scale drawings.

02. All dimensions are from gridline to centerline of structural columns, to centerline of windows and doors, or to face of stud walls. Re: Struct. for Concrete Walls.

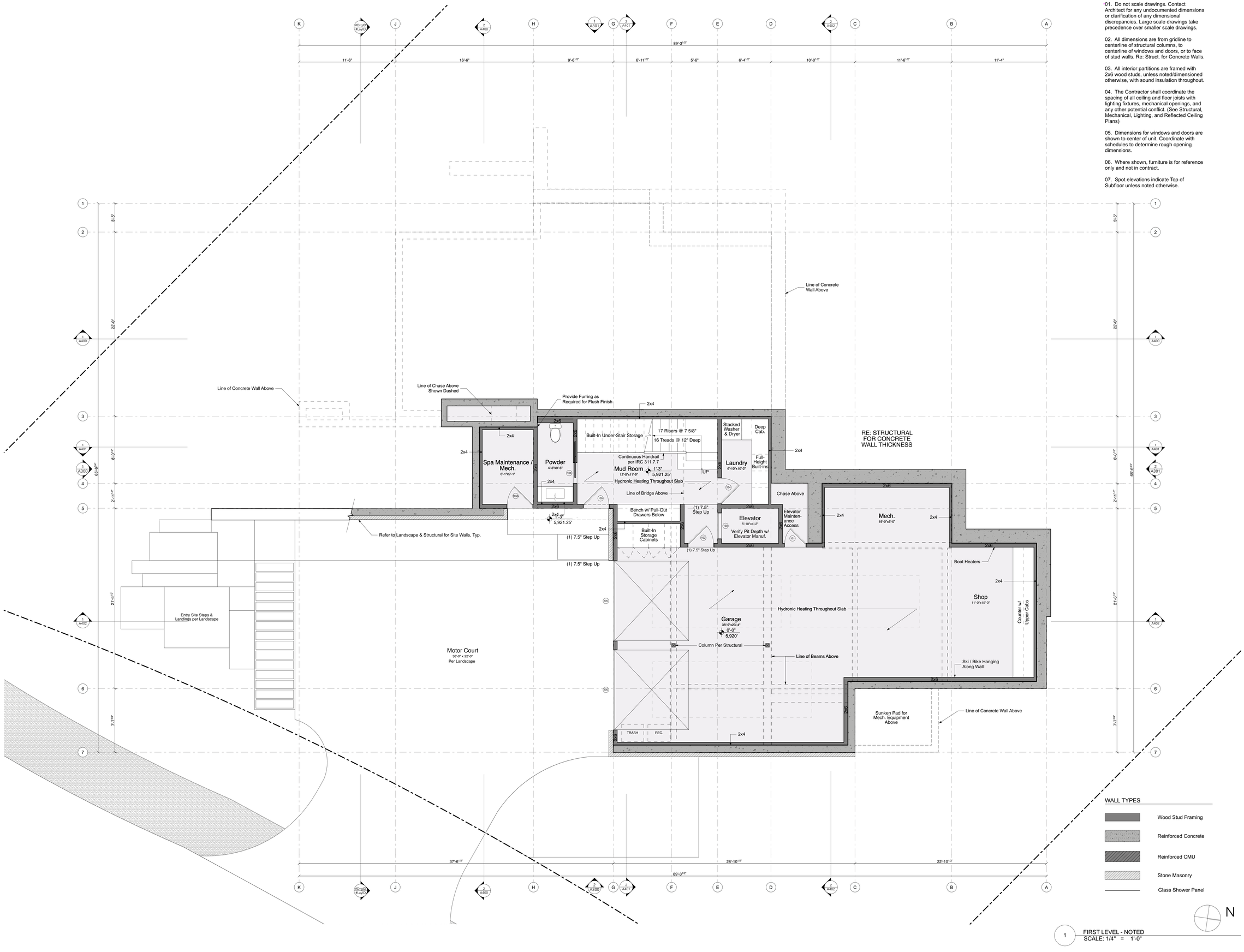
03. All interior partitions are framed with 2x6 wood studs, unless noted/dimensioned otherwise, with sound insulation throughout.

04. The Contractor shall coordinate the spacing of all ceiling and floor joists with lighting fixtures, mechanical openings, and any other potential conflict. (See Structural, Mechanical, Lighting, and Reflected Ceiling Plans)

05. Dimensions for windows and doors are shown to center of unit. Coordinate with schedules to determine rough opening dimensions.

06. Where shown, furniture is for reference only and not in contract.

07. Spot elevations indicate Top of Subfloor unless noted otherwise.



WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel

N

1 FIRST LEVEL - NOTED
SCALE: 1/4" = 1'-0"

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A201
FIRST LEVEL PLAN - NOTED

v5

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WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel

N

1 SECOND LEVEL - NOTED
SCALE: 1/4" = 1'-0"

FARMERPAYNE
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LICENSED ARCHITECT
AR 986479
5/31/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

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A202

SECOND LEVEL PLAN - NOTED

v5

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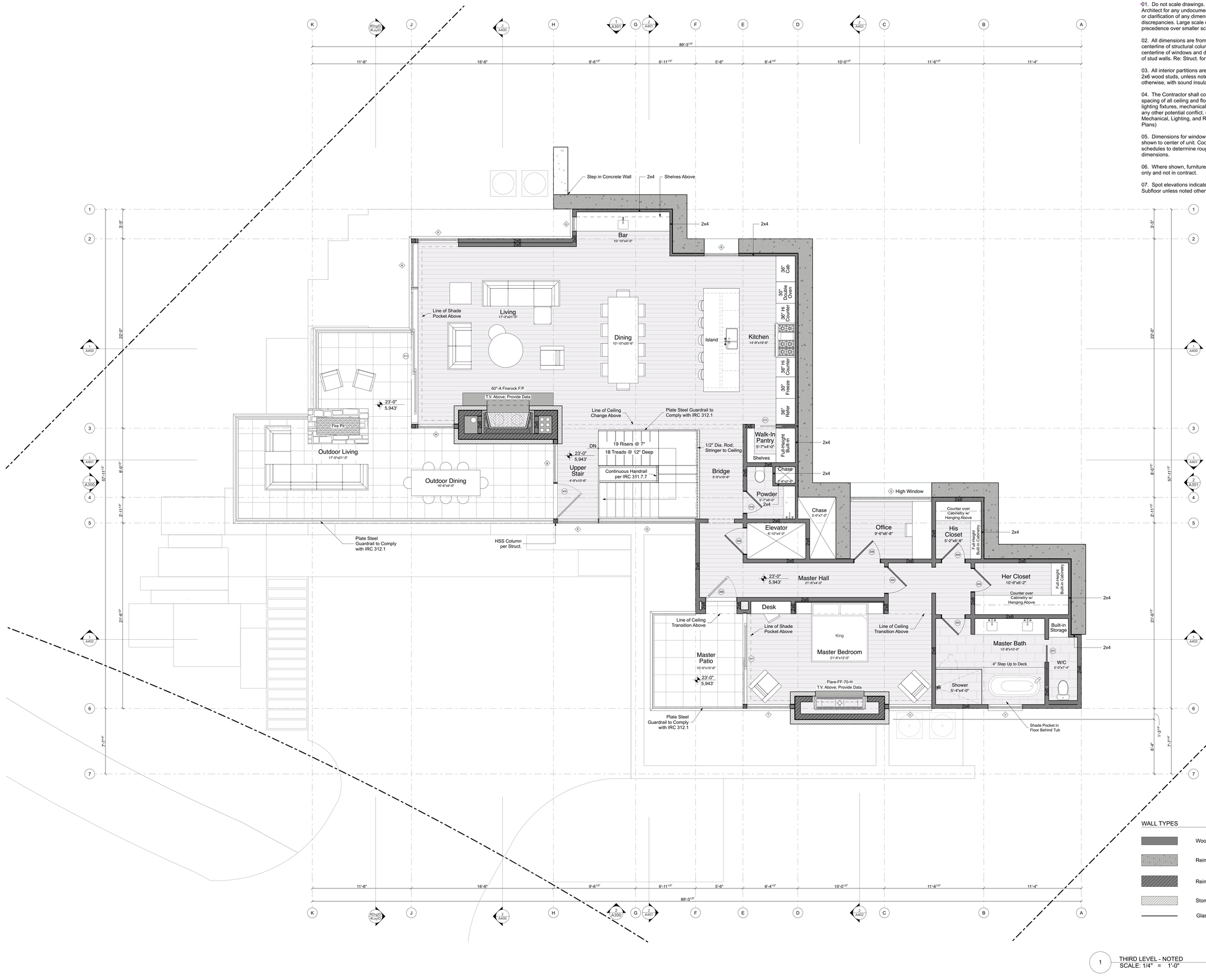

WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel

N

1 THIRD LEVEL - NOTED
SCALE: 1/4" = 1'-0"

FARMERPAYNE
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AR 986479
6/1/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

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406 SAGE RD, KETCHUM
ID 83340

DATE:	6/1/23
PROJECT #:	SV2202
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A203

THIRD LEVEL PLAN - NOTED

v5

ROOF PLAN NOTES

01. All dimensions shown are measured to edge of fascia. Contact architect for any discrepancies.

02. All vents including radon and plumbing to be routed up fireplace walls. Verify penetrations to be routed through sloped roof w/ Architect.

03. All Roof Drains & Internal Gutters to connect to internal Downspouts w/ Heat Tape; Verify locations w/ G.C., Arch, Roofing & Plumbing Sub Contractor. Provide heat tape at all gutters and downspouts.

Internal Downspout
External Downspout Below
Internal Gutter, Typ.
Internal Downspout
Internal Gutter, Typ.
Line of Deck Below
Line of Exterior Wall Below
1:12 Slope
Line of Exterior Wall Below
Line of Fire Pit Below
Patio Below
1/4:12 Min. Slope
Flat Roof
RD
1/4:12 Min. Slope
1/4:12 Min. Slope
Internal Downspout
Internal Gutter, Typ.
Internal Downspout
Line of Exterior Wall Below
Line of Exterior Wall Below
Entry Site Steps & Landings per Landscape
Line of Exterior Wall Below
Internal Downspout
1:12 Slope
Line of Exterior Wall Below
Line of Deck Below
Line of Exterior Wall Below
89'-3 1/2"
56'-4 1/2"
32'-11"
11'-6"
16'-6"
16'-6"
44'-9 1/2"
89'-3 1/2"
8'-5"
22'-0"
8'-5 1/2"
2'-11 1/2"
65'-8 3/4"
21'-6 1/2"
7'-7 1/2"
2'-6"
13'-6"
3'-0"
3'-0"
3'-0"

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

N

FARMERPAYNE ARCHITECTS

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Jackson, WY 83001
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5/31/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

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Design Review Response	

A204
ROOF PLAN

v5

GENERAL REFLECTED CEILING PLAN NOTES

01. Do not scale drawings. Contact Architect for any undocumented dimensions or clarification of any dimensional discrepancies. Large scale drawings take precedence over smaller scale drawings.

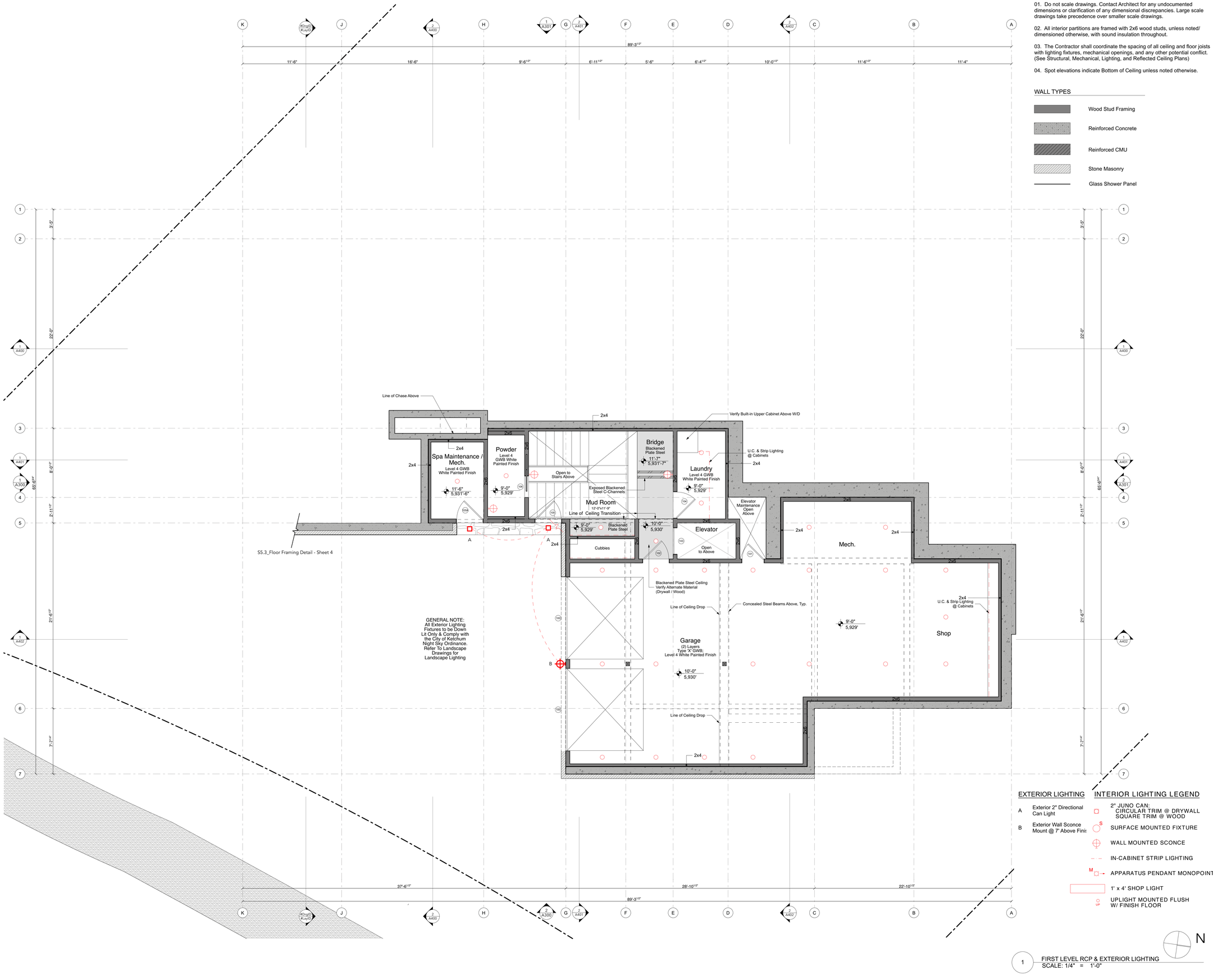
02. All interior partitions are framed with 2x6 wood studs, unless noted/ dimensioned otherwise, with sound insulation throughout.

03. The Contractor shall coordinate the spacing of all ceiling and floor joints with lighting fixtures, mechanical openings, and any other potential conflict. (See Structural, Mechanical, Lighting, and Reflected Ceiling Plans)

04. Spot elevations indicate Bottom of Ceiling unless noted otherwise.

WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel



EXTERIOR LIGHTING

A Exterior 2" Directional Can Light

B Exterior Wall Sconce Mount @ 7' Above Finis

INTERIOR LIGHTING LEGEND

- 2" JUNO CAN: CIRCULAR TRIM @ DRYWALL SQUARE TRIM @ WOOD
- SURFACE MOUNTED FIXTURE
- WALL MOUNTED SCONCE
- IN-CABINET STRIP LIGHTING
- APPARATUS PENDANT MONOPOINT
- 1' x 4' SHOP LIGHT
- UPLIGHT MOUNTED FLUSH W/ FINISH FLOOR

N

1 FIRST LEVEL RCP & EXTERIOR LIGHTING
SCALE: 1/4" = 1'-0"

FARMERPAYNE ARCHITECTS

Jackson Hole
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ARCHITECT STAMP

LICENSED ARCHITECT AR 986479
5/4/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

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A211
FIRST LEVEL RCP & EXTERIOR LIGHTING

V5

GENERAL REFLECTED CEILING PLAN NOTES

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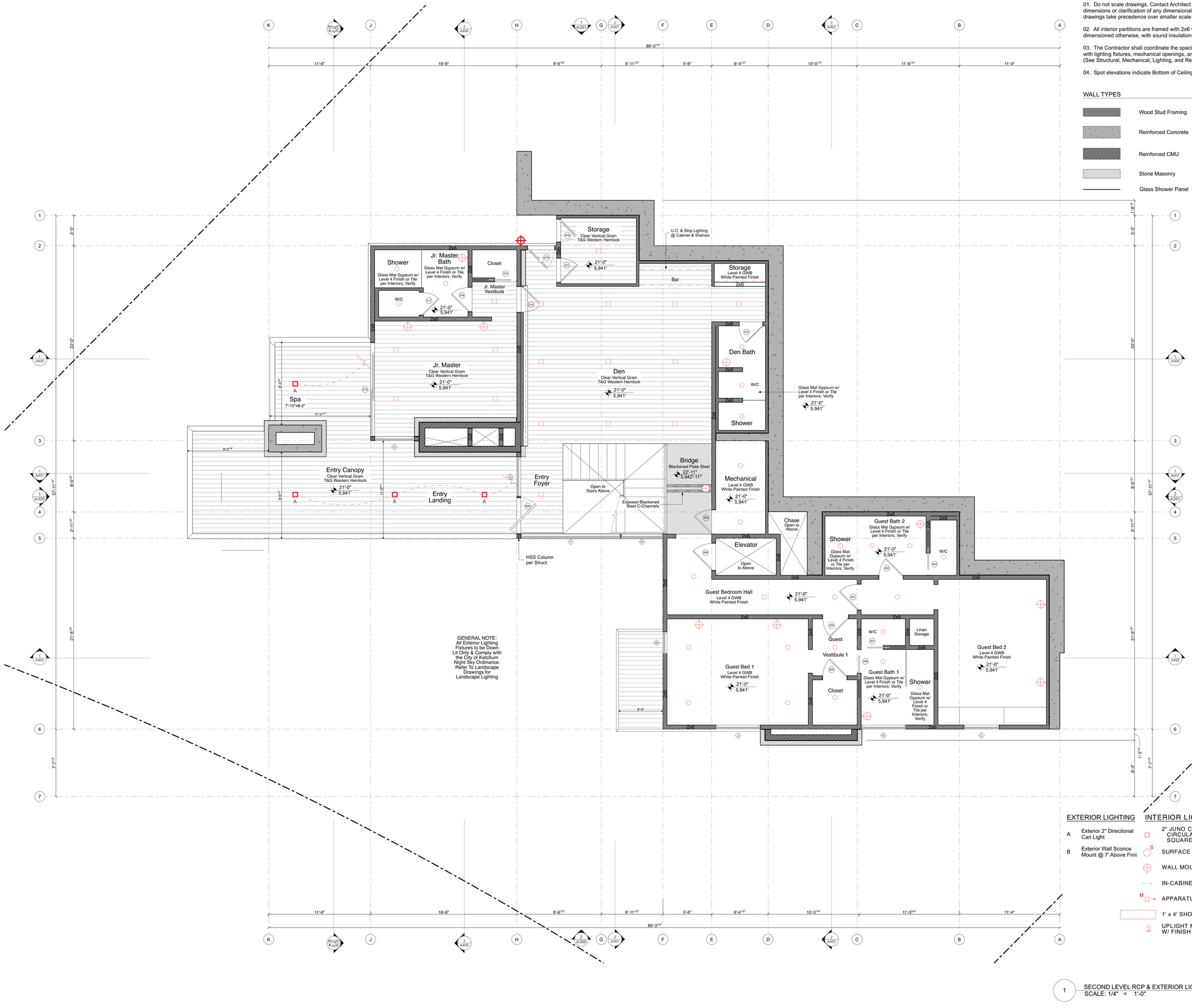
WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel



EXTERIOR LIGHTING

A	Exterior 2" Directional Can Light
B	Exterior Wall Sconce Mount @ 7' Above Finis

INTERIOR LIGHTING LEGEND

- 2" JUNO CAN: CIRCULAR TRIM @ DRYWALL SQUARE TRIM @ WOOD
- S — SURFACE MOUNTED FIXTURE
- WALL MOUNTED SCONCE
- IN-CABINET STRIP LIGHTING
- M — APPARATUS PENDANT MONOPOINT
- 1' x 4' SHOP LIGHT
- UP — UPLIGHT MOUNTED FLUSH W/ FINISH FLOOR

N

1 SECOND LEVEL RCP & EXTERIOR LIGHTING
SCALE: 1/4" = 1'-0"

FARMERPAYNE ARCHITECTS

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A212
SECOND LEVEL RCP & EXTERIOR LIGHTING

v5

GENERAL REFLECTED CEILING PLAN NOTES

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WALL TYPES

- Wood Stud Framing
- Reinforced Concrete
- Reinforced CMU
- Stone Masonry
- Glass Shower Panel

Line of Stepped Metal Panel Roof Fascia
2x4
Bar
Living
Dining
Kitchen
Vaulted Clear Vertical Grain T&G Western Hemlock
1:12 Slope
Line of Shade Pocket
Outdoor Living
Vaulted Clear Vertical Grain T&G Western Hemlock
Line of Ceiling Transition
Blackened Steel Beam
Pantry
Clear Vertical Grain T&G Western Hemlock
32'-0" 5,952'
Stairwell
Clear Vertical Grain T&G Western Hemlock
Upper Stair
Bridge
Line of Metal Panel Roof Fascia
Outdoor Dining
Powder
Level 4 GWB White Painted Finish
Line of Ceiling Transition; Blackened Plate Steel Portal
Office
Level 4 GWB White Painted Finish
34'-0" 5,954'
His Closet
Level 4 GWB White Painted Finish
Elevator
(2) Layers Type 'X' GWB
Chase
(2) Layers Type 'X' GWB
Master Hall
Level 4 GWB White Painted Finish
Master Bedroom Vestibule
Level 4 GWB White Painted Finish
Her Closet
Level 4 GWB White Painted Finish
GENERAL NOTE:
All Exterior Lighting Fixtures to be Down Lit Only & Comply with the City of Ketchum Night Sky Ordinance. Refer To Landscape Drawings for Landscape Lighting
MASTER DECK
T&G Wood; Finish TBD
Vaulted T&G Wood Finish TBD
Line of Metal Panel Roof Fascia
Line of Shade Pocket
Master Bedroom
T&G Wood; Finish TBD
Master Bath
Glass Mat Gypsum w/ Level 4 Finish or Tile per Interiors; Verify
W/C
Shower
Glass Mat Gypsum w/ Level 4 Finish or Tile per Interiors; Verify
Line of Step In Roof Fascia

EXTERIOR LIGHTING

A Exterior 2" Directional Can Light

B Exterior Wall Sconce Mount @ 7' Above Finis

INTERIOR LIGHTING LEGEND

- 2" JUNO CAN: CIRCULAR TRIM @ DRYWALL SQUARE TRIM @ WOOD
- SURFACE MOUNTED FIXTURE
- WALL MOUNTED SCONCE
- IN-CABINET STRIP LIGHTING
- APPARATUS PENDANT MONOPOINT
- PENDANT FIXTURE TBD
- UPLIGHT MOUNTED FLUSH W/ FINISH FLOOR

1 THIRD LEVEL RCP EXTERIOR LIGHTING
SCALE: 1/4" = 1'-0"

FARMERPAYNE ARCHITECTS

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A213
THIRD LEVEL RCP & EXTERIOR LIGHTING

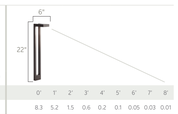
VS

12V Two Arm Path Light with LED Lamp

15844

DIMENSIONS

18121



PHOTOMETRICS*

Distance from Light	0'	1'	2'	3'	4'	5'	6'	7'	8'
Footcandles*	8.3	5.2	1.5	0.6	0.2	0.1	0.05	0.03	0.01

* Values stated for supplied lamp with fixture

RECOMMENDED LED LAMPS* (sold separately)

18120	1.5W, 2.4VA, 2700K, 130 lumnes, 120° Beam
18121	**1.5W, 2.4VA, 3000K, 130 lumnes, 120° Beam**
18198	1.1W, 1.2VA, 2700K, 85 lumnes, 180° Beam
18199	1.1W, 1.2VA, 3000K, 85 lumnes, 180° Beam
18204	2.3W, 3.3VA, 2700K, 215 lumnes, 300° Beam
18205	2.3W, 3.3VA, 3000K, 215 lumnes, 300° Beam

* Power usage at 12V AC Input

INSTALLATION INFORMATION

Power (W)	Wire Gauge / Length / (ft/m) Load Chart			
	10	12	14	16
0-20	1860/567	1150/351	730/223	450/137
40	930/283	580/177	370/113	230/70
60	620/189	390/119	240/73	150/46
80	470/143	290/88	180/55	110/34
100	370/113	230/70	140/43	90/27
>100	Consult Technical Support			

TROUBLESHOOTING

Fixture does not illuminate	Verify power connections. Review installation guide for installation problem. Insure manual reset breaker has not been tripped.
Fixture turns off	Verify power connections. Review installation guide for installation problems. Insure manual reset breaker has not been tripped. Check voltage drop at fixture.
Fixture trips breaker	Check installation for a possible short or overload state. Isolate the identified short and replace affected fixture or remove fixture(s) installed in overload.

LISTING

UL 1838 Issued: 2003/01/13 Ed: 3 Rev: 2015/01/13
Low Voltage Landscape Lighting Systems.

CSA C22.2#250.7 Issued: 2007/11/01 (R2012)
Ed: 1 Extra-low-voltage landscape lighting systems – General Instruction No. 1: 2008.

CE marking in accordance with IEC 62471 Issue:2006/07/01 Ed:1 Photobiological safety of lamps and lamp systems. No. 219 CE/ CB Scheme. Aluminum fixtures only.

Contact: layouts@kichler.com

1. Actual efficacy value can be calculated as follows: Lumen value divided by average power consumption.
2. Do not extend beyond the recommended maximum run length.
3. Recommend product be installed with 10 or 12 gauge wire.
4. Recommend 80% load/20% overhead rule for fixture load planning; in reference to the power source. Calculating fixture loading this way, provides additional resource for fixture adjustment and loss due to voltage drop due to wire run lengths.
5. We reserve the right to modify and improve the design of our fixtures without prior notice. We cannot guarantee to match existing installed fixtures for subsequent orders or replacements in regards to product appearance, CCT, or lumen output.
6. Do not modify product beyond instructions or warranty will be void.

WARRANTY

See Kichler.com/Warranty for warranty details.

Consult Kichler Advanced Product Solutions for additional support at 844-452-5437.

KICHLER

Landscape Two Arm Path Light

2CPNC G2 SQ

JUNO

Project:

Fixture Type:

Location:

Contact/Phone:

2" IC 600 AND 1000 LUMENS LED SQUARE DOWNLIGHT 2CPNC G2 SQ CHICAGO PLENUM

PRODUCT DESCRIPTION

2 inch aperture recessed downlight approved for City of Chicago Environmental Air (CCEA) • IC rated for insulated or non-insulated applications • Luminaire produces up to 1000 lumens and is available with optical distributions approximating that of 75W MR16 halogen lamps • Designed to provide 50,000 hours of life • 5 year limited warranty on LED Components • CCEA marking per the electrical code specifications of the City of Chicago, commonly referred to as "Chicago Plenum".

ENVIRONMENTALLY FRIENDLY, ENERGY EFFICIENT

- No harmful ultraviolet or infrared wavelengths
- No lead or mercury, RoHS compliant
- Comparable light output up to a 75W MR16 halogen lamp

PRODUCT SPECIFICATIONS

LED Light Engine Exceptional fixture to fixture color consistency within a 3-step MacAdam ellipse • 2700K, 3000K, 3500K, and 4000K color temperatures are available with 80 CRI or 90 CRI minimum.

Modular Optics Available with field interchangeable optics in 18° Spot, 24° Narrow Flood, or 40° Flood distributions.

Aesthetic Trim Trim features die cast beveled knife edge trim ring for clean ceiling interface available in white, black, satin nickel, or brushed bronze • Die cast baffles are available in white, black, satin nickel, or brushed bronze

LED Driver Choice of dedicated 120 volt (120) driver or universal voltage (MVOLT) driver that accommodates input voltages from 120-277 volts AC at 50/60Hz • Power factor > 0.9 • Dedicated 120 volt driver (120) is dimmable with the use of most incandescent, magnetic low voltage and electronic low voltage dimmers • Universal voltage driver (MVOLT) is dimmable with the use of most 0-10V protocol dimmers • For a list of compatible dimmers, see JUNO.COM.

Life Rated for 50,000 hours at 70% lumen maintenance.

Labels CCEA Marking: U.L. listed for use in environment air spaces other than ducts and plenums per the Electrical Code specifications of the City of Chicago • ENERGY STAR® Certified • 90CRI fixtures are certified to the high efficacy requirements of California T24 JA8:2016 • Meets energy code Air Leakage requirements per ASTM E283 • UL and cUL listed for wet locations.

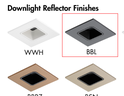
Junction Box Includes (7) ½" and (1) ¾" knock-outs equipped with pryout slots • Push-in electrical connectors for field connections.

Mounting Designed for use in IC (insulated ceiling) or NON-IC new construction thicknesses from ½" to 1" • For thicker ceilings up to 1 ½", order 2JCTA150 • 2CPNC requires 2x8 construction • LED driver and trim installs directly into 2CPNC housing, with provided conduit connector.

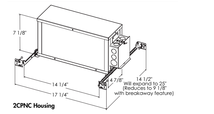
Real Nail 3 Bar Hangers Chicago Plenum new construction housing, 2CPNC available with patented telescoping Real Nail(R) bar hanger system which permits quick placement of housing anywhere with 24" O.C. joists or suspended ceilings • Includes removable nail for repositioning of fixture in wood joist construction • Integral T-bar notch and clip for suspended ceilings • Design covered under US Patent D.552,969.

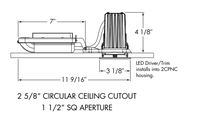
Specifications subject to change without notice.

Downlight Reflector Finishes



DIMENSIONS





2 5/8" CIRCULAR CEILING CUTOUT
1 1/2" SQ APERTURE

AcuityBrands. One Lithonia Way • Conyers, GA 30012 • Phone 1.800.705.SERV (7378) • Visit us at www.acuitybrands.com/juno-recessed
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1 of 4

Landscape Two Arm Path Light

IKON OUTDOOR STEP LIGHT

TECH LIGHTING

The Ikon outdoor step light features a minimized rectangular aperture that aims illumination downward to light stairs with minimal glare. Ideal for wayfinding and added safety after dark. Available in two finishes, Black and Bronze.

- **Selectable CCT (2700K/3000K)**
- **120V or 12V**
- **Outstanding protection against the elements:**
  - **Wet Listed IP66 Rated**
  - **Stainless Steel Mounting Hardware**
  - **Powder Coat Finishes**

SPECIFICATIONS

DELIVERED LUMENS	202 (2700K)
WATTS	12.2
VOLTAGE	12V (Transformer sold separately) or 120V
DIMMING	12V ELV, MLV and Triac. 120V not dimmable
LIGHT DISTRIBUTION	Symmetric
OPTICS	Not applicable
MOUNTING OPTIONS	Step: 2x4 junction box
CCT	2700K/3000K Selectable
CRI	90+
COLOR BINNING	3 Step
BUG RATING	B0-U3-G1
DARK SKY	Compliant
WET LISTED	IP66
GENERAL LISTING	ETL
CALIFORNIA TITLE 24	Can be used to comply with CEC 2019 Title 24 Part 6 for outdoor use. Registration with CEC Appliance Database not required.
START TEMP	-30°C
FIELD SERVICEABLE LED	No
CONSTRUCTION	Aluminum
HARDWARE	Stainless Steel
FINISH	Powder Coat
LED LIFETIME	L70: >60,000 Hours
WARRANTY*	5 Years
WEIGHT	1 lb.

* Visit techlighting.com for specific warranty limitations and details.

IKON OUTDOOR WALL/STEP LIGHT
shown in Black

IKON OUTDOOR WALL/STEP LIGHT
shown in Bronze

12V AC TRANSFORMERS*

(OUTDOOR RATED, ORDERED SEPARATELY)

ITEM	DESCRIPTION	HOUSING	DIMMING
700OT150T	MAGNETIC, 150W, 120V	STAINLESS STEEL	MAGNETIC
700OT300T	MAGNETIC, 300W, 120V	STAINLESS STEEL	MAGNETIC

*WE DO NOT RECOMMEND USING GREATER THAN 70% OF THE MAXIMUM WATTAGE SPECIFIED FOR THE LOW VOLTAGE TRANSFORMER DUE TO INRUSH CURRENT REQUIREMENTS.

ORDERING INFORMATION

PRODUCT	CRI/CCT	FINISH	VOLTAGE
700IKWN	90 CRI 2700K/3000K SELECTABLE	B BLACK Z BRONZE	12 12V* 120 120V

*REQUIRES 12V REMOTE TRANSFORMER

Landscape IKON Step Light

Icon Outdoor Wall Light

By dweLED

YLIGHTING
Call Us 866 428 9289

Product Options

Finish: Bronze, Brushed Aluminum

Details

- Low-glare illumination
- Up and down light
- White diffuser lens
- Dimmable from 100-0% with an ELV dimmer (not included)
- Driver located inside the fixture
- Universal driver (120V-220V-277V)
- Material: Aluminum
- ADA compliant, Title 24 compliant
- ETL Listed Wet
- Warranty: Limited 5 Year Functional, 2 Year Finish
- Made In China

Dimensions

Fixture: Width 5", Height 14", Depth 3"

Lighting

- 11 Watt (845 Lumens) 120 Volt/277 Volt Integrated LED: CRI: 90 Color Temp: 3000K 2700K
  Lifespan: 54000 hours

Additional Details

Product URL:
https://www.ylighting.com/icon-outdoor-wall-light-by-dweled-DWEP154761.html
Rating: ETL Listed Wet

Notes:

CUSTOMIZED TO BE DOWNLIGHT ONLY
W/ 2700K BULB TEMPERATURE

Product ID: DWEP154761

Prepared by:

Prepared for:
Project:
Room:
Placement:
Approval:

Created February 20th, 2019

B - Exterior Icon Wall Sconce

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ARCHITECT STAMP

LICENSED ARCHITECT
AR 986479
5/31/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE
406 SAGE RD, KETCHUM ID 83340

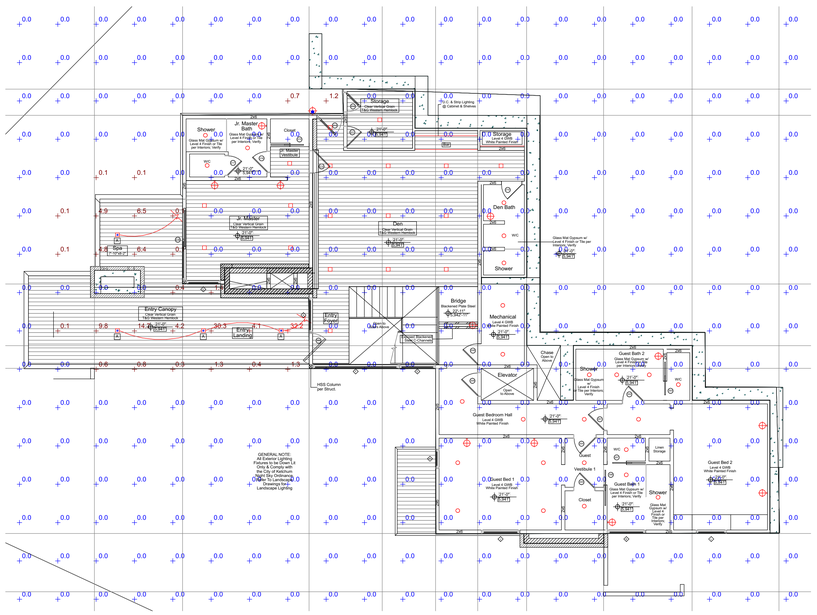
DATE:	5/31/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:

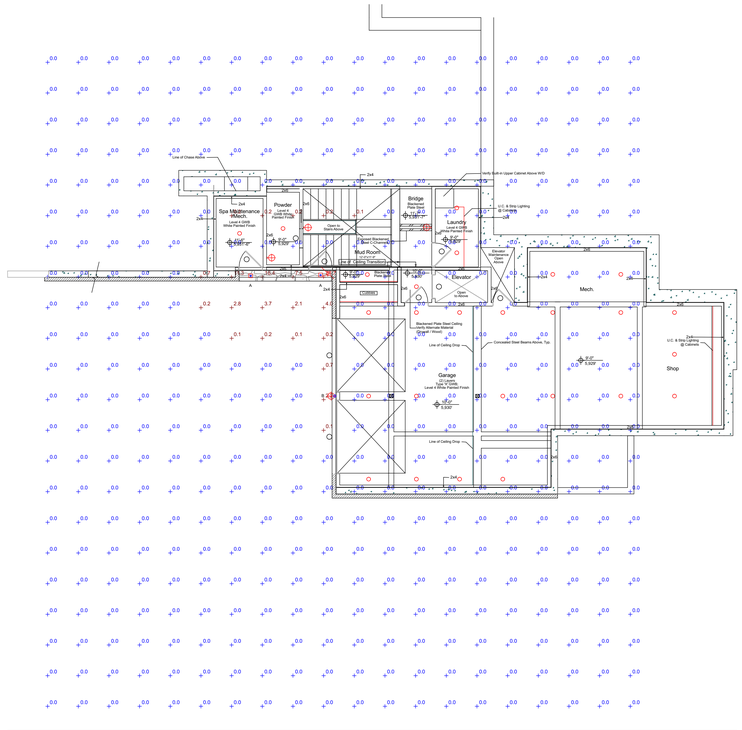
Design Review	3.31.23
Design Review Response	

A214
EXTERIOR LIGHTING SPECIFICATIONS

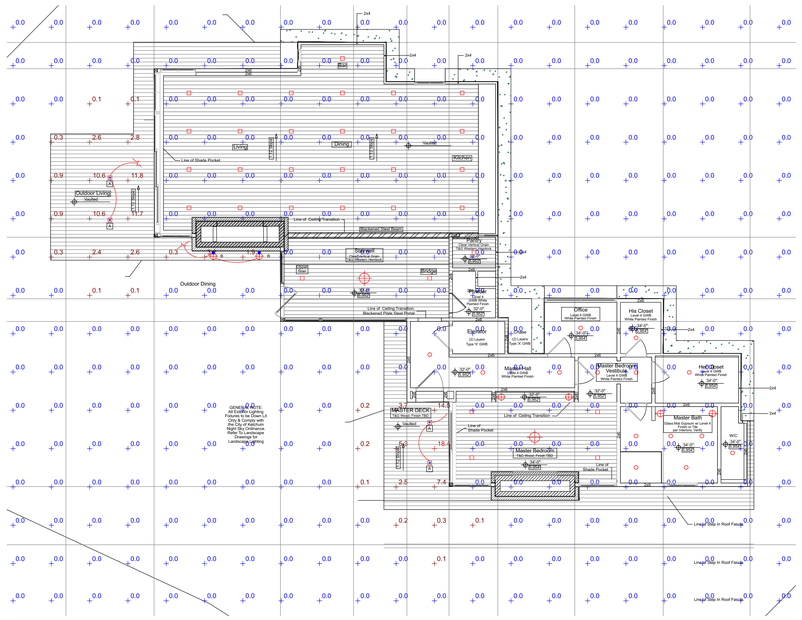
V5



SECOND LEVEL PHOTOMETRIC LIGHTING PLAN SCALE: 1/8" = 1' - 0"



FIRST LEVEL PHOTOMETRIC LIGHTING PLAN SCALE: 1/8" = 1' - 0"



THIRD LEVEL PHOTOMETRIC LIGHTING PLAN SCALE: 1/8" = 1' - 0"

PHOTOMETRIC SITE LIGHTING PLAN SCALE: 1/8" = 1' - 0"

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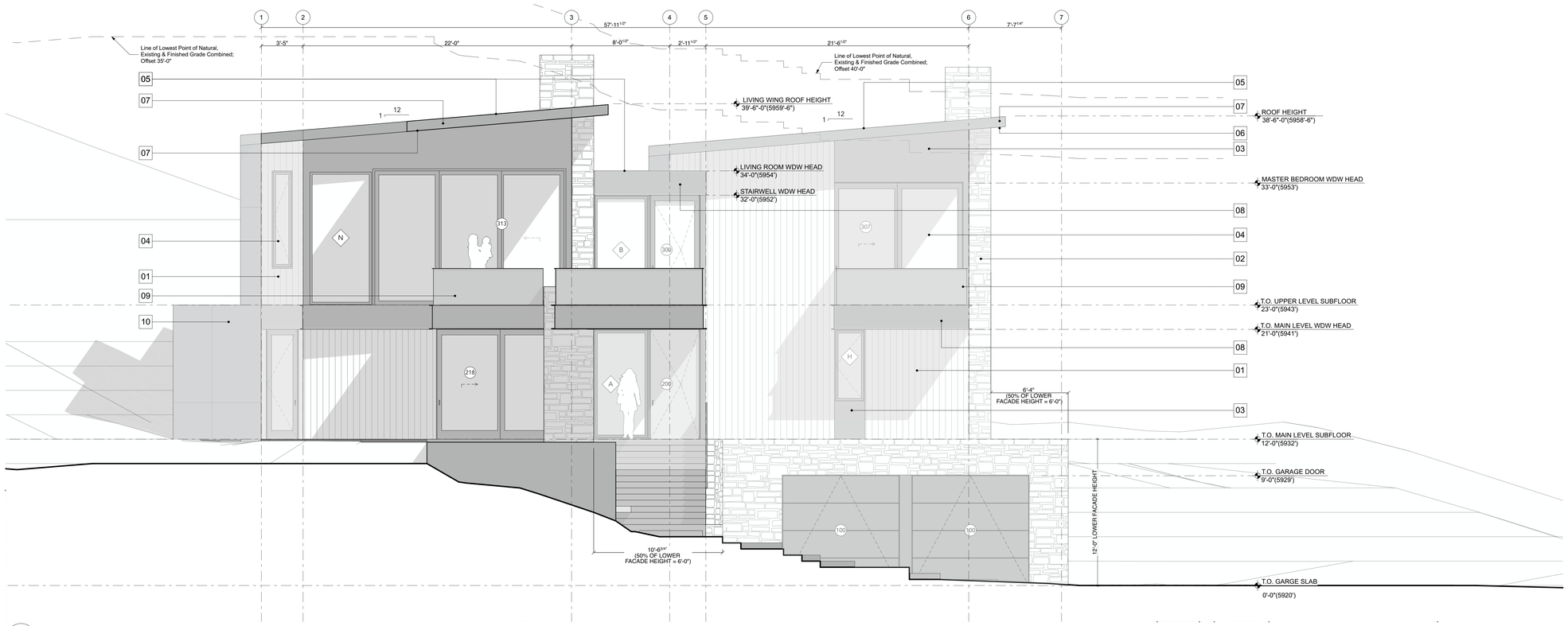
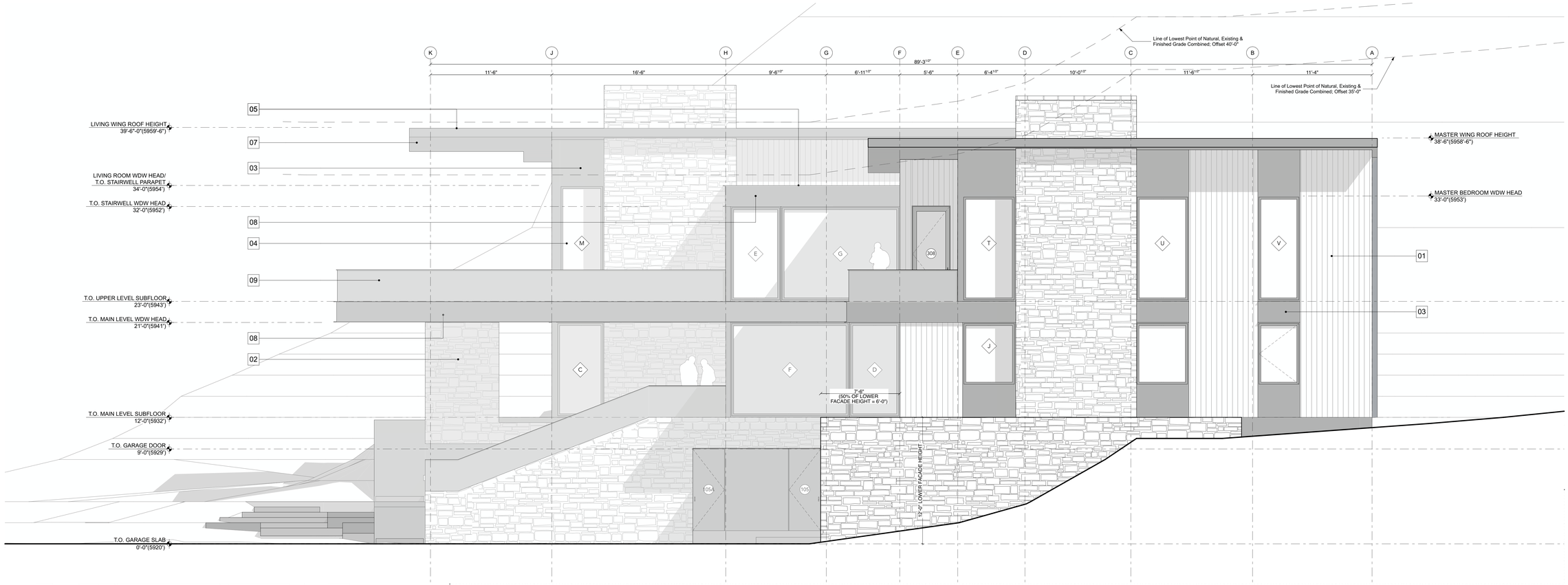
A215
PHOTOMETRIC PLANS

vs



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



2 EAST ELEVATION
SCALE: 1/4" = 1'-0"

ELEVATION KEY NOTES

1. Vertical Wood Siding; Quality of Hewn - Rustic Reclaimed WRC STK
2. Grouted Stone Veneer; Quality of Select Stone - Atlas Granite 6069-6074
3. Pre-Finished Metal Panels to Match Windows / Doors; Gauge & Blackened / Dark Bronze Finish TBD
4. Aluminum Windows & Doors; Quality of Glo Blackened / Dark Bronze Finish TBD
5. Fully Adhered EPDM Flat Roof / 1:12 Shed Roof
6. 1x T&G Oak Soffit, Stained TBD
7. Pre-Finished Metal Fascia; Gauge & Blackened / Dark Bronze Finish TBD
8. Blackened Exposed Structural Steel; Blackened / Dark Bronze Finish TBD
9. Blackened Perforated Steel Guardrails
10. Panelized Concrete

NOTE: ALL FINISHES TO BE APPROVED BY ARCHITECT THRU SUBMITTALS / SAMPLES, G.C. TO VERIFY WITH ARCHITECT BEFORE INSTALL, TYP.

NOTE: CHIMNEY AND MECHANICAL EXHAUST MUST BE FITTED W/ SPARK ARRESTOR.

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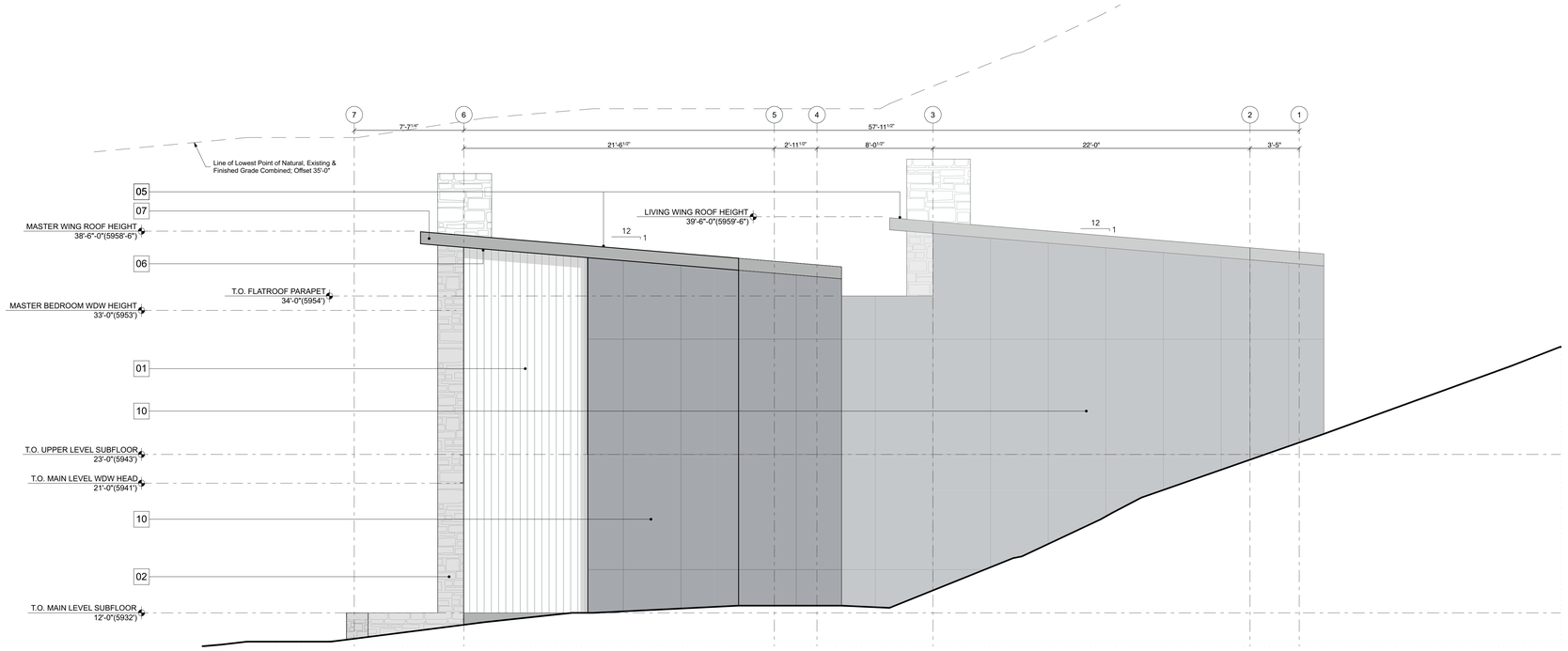
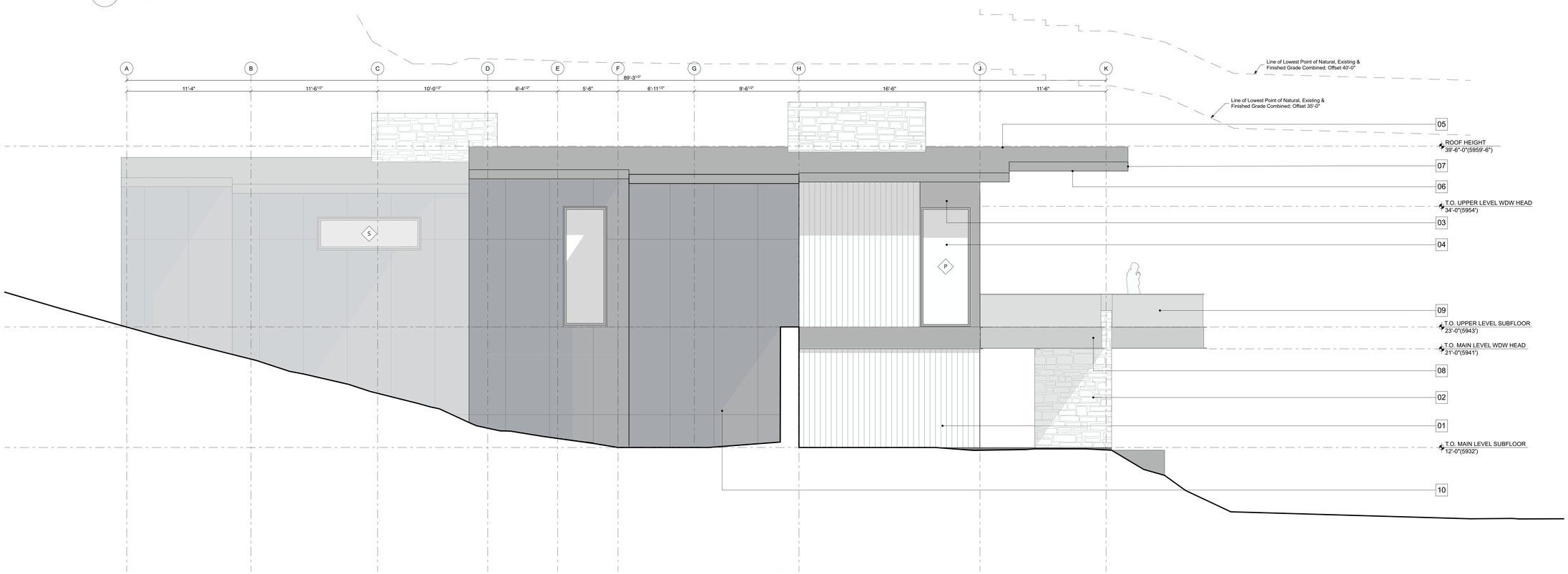
Design Review Response	

A300

BUILDING ELEVATIONS



2 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



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

ELEVATION KEY NOTES

1. Vertical Wood Siding;
Quality of Hewn - Rustic Reclaimed WRC STK
2. Grouted Stone Veneer;
Quality of Select Stone - Atlas Granite 6069-6074
3. Pre-Finished Metal Panels to Match Windows / Doors;
Gauge & Blackened / Dark Bronze Finish TBD
4. Aluminum Windows & Doors; Quality of Glo
Blackened / Dark Bronze Finish TBD
5. Fully Adhered EPDM Flat Roof / 1:12 Shed Roof
6. 1x T&G Oak Soffit, Stained TBD
7. Pre-Finished Metal Fascia;
Gauge & Blackened / Dark Bronze Finish TBD
8. Blackened Exposed Structural Steel;
Blackened / Dark Bronze Finish TBD
9. Blackened Perforated Steel Guardrails
10. Panelized Concrete

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NOTE: CHIMNEY AND MECHANICAL EXHAUST MUST BE FITTED W/ SPARK ARRESTOR.

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Scott Payne
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Design Review Response	

A301
BUILDING ELEVATIONS

v5

FACADE STEPBACK DIAGRAM

12'-0" HIGH LOWER FACADE; 6'-0" STEP BACK REQUIRED FOR 5' HEIGHT BONUS (MAX. 40')
REFER TO SHEET A300 - BUILDING ELEVATIONS FOR 2-D SETBACK DIMENSIONS

- UPPER FACADE 2 STEPPED BACK 6'-4" FROM LOWER FACADE 1
- UPPER FACADE 4 STEPPED BACK 7'-6" FROM LOWER FACADE 3
- UPPER FACADE 6 STEPPED BACK 10'-6" FROM LOWER FACADE 5
- UPPER FACADE 7 STEPPED BACK 1'-4" FROM LOWER FACADE 5; FACADE 7 DOES NOT NEED TO HEIGHT BONUS (UNDER 35'-0")

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LICENSED ARCHITECT AR 986479
5/18/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

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406 SAGE RD, KETCHUM ID 83340

DATE:	5/18/23
PROJECT #:	SV2202
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Design Review	3.31.23
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A302
FACADE STEPBACK DIAGRAM

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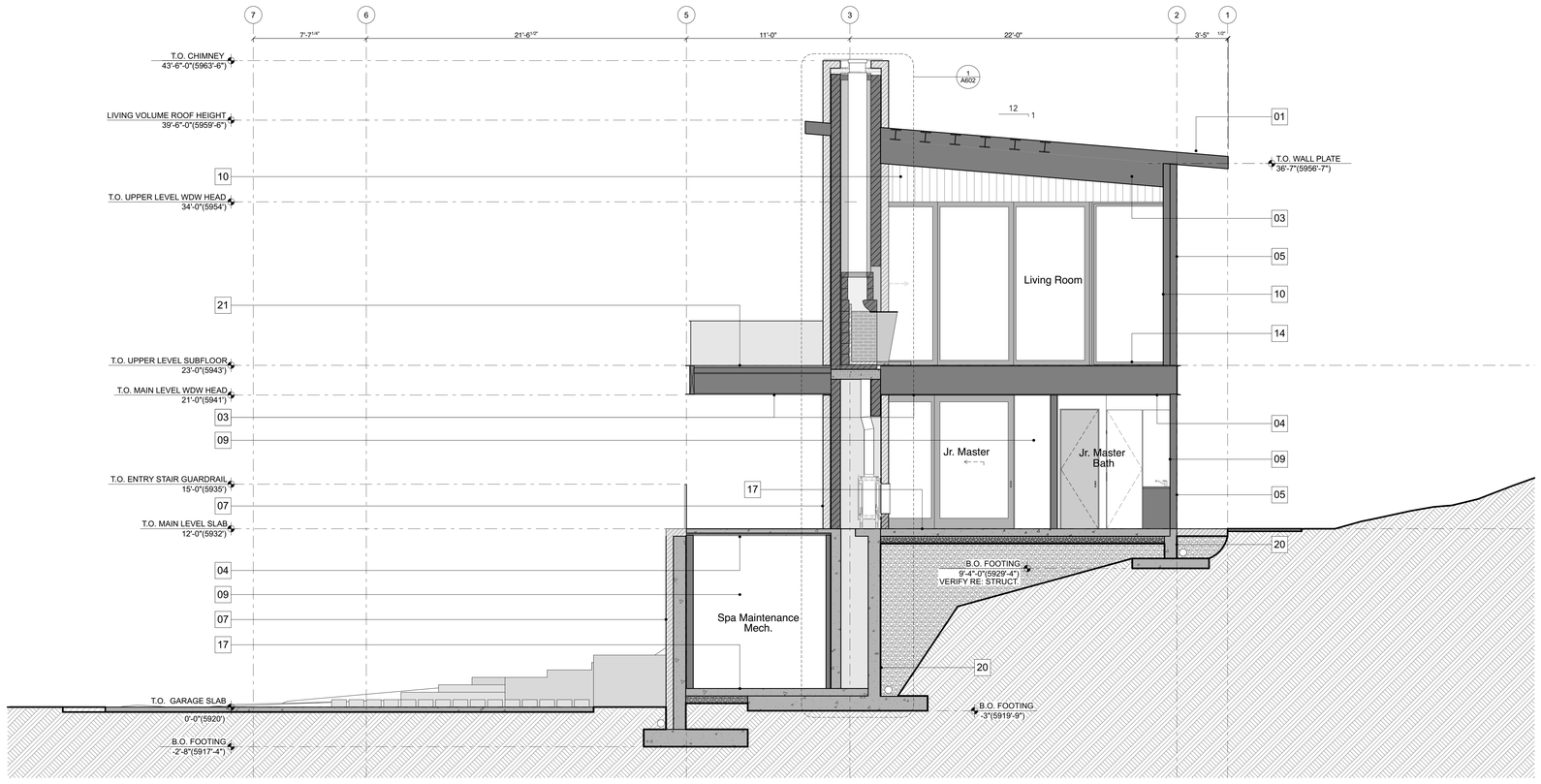
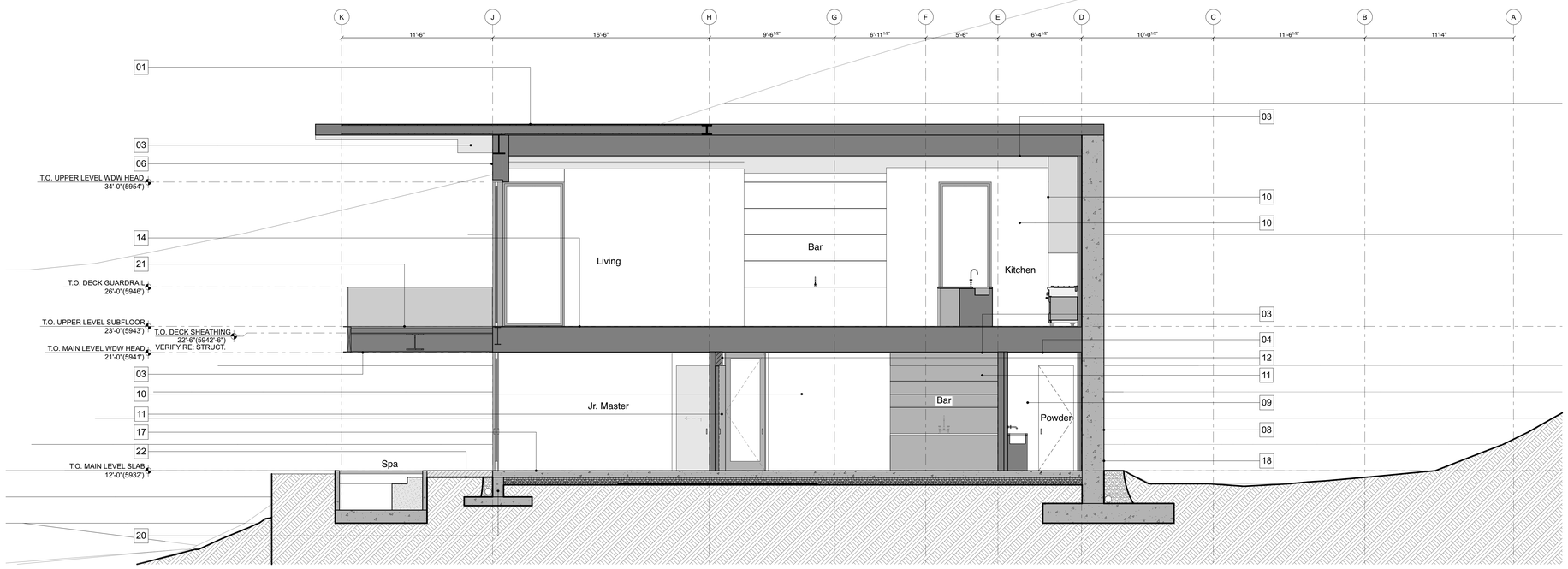


2 BUILDING SECTION
SCALE: 1/4" = 1'-0"



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

ASSEMBLY NOTES

1 **Shed Roof @ 1:12 Roof Pitch:**
Fully Adhered 80mm EPDM Roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on Fully-Adhered Ice and Water Shield Underlayment, on Plywood Sheathing, on Wood Sleeper / MPP Framing, on Plywood Sheathing, on pre-manufactured wood trusses OR "I" Joist rafter framing (Re: Struct) w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Roof Edges, typ. Provide snow retention system; to be coordinated with Architect, General Contractor, and Roofing Sub Contractor. Provide heat cable at edge of the roofline and gutters. NO THERMAL BREAKS of the Structure.

2 **Flat Roof @ Parapet Roof:**
Fully Adhered 80mm EPDM roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on tapered rigid insulation (1 1/2" min.) w/ 0.25:12 slope, on DensDeck, on Fully-Adhered Ice and Water Shield Underlayment, on plywood roof sheathing, on I joist framing, Re: Struct., w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Curbs, Wall Transitions and Roof Edges, typ. Provide self-adhering ice and water shield up all Wall transitions 3'-0" min., over curbs & overlap all valleys 3'-0" min. to either side. See roof plan for roof slope and drain/downspout locations. Provide heat cable at all downspouts and scuppers. NO THERMAL BREAKS of the Structure.

3 **Exterior & Interior Soffit:**
Trim-less 1x6 T&G 1/16" Shadowline Joint, Quality of TBD (Or Alternative Provided by Poster), with Hidden Fastener Connection to Structural Frame Above.

4 **Interior Ceiling:**
Level 4 Sheetrock Painted Finish/Color, TBD, Trim-less 5/8" Sheetrock with LEVEL 4 SMOOTH Mud-Work on
Ceiling Framing Framing, with Sound-Batt Noise Insulation @
1st & 2nd Levels, Typ; Verify Glass Mat / Waterproofing w/ RCP

5 **Exterior Wall Assembly @ Wood Siding:**
Vertical Trim-less 1x6 T&G Butt Joint, Quality of Hewn Rustic Reclaimed, (Or Alternative Provided by Poster), on Commercial Grade Drainage Wrap, Quality of Benjamin Obdyke HydroGap, (Or Alternate Provided by Poster) per Manufacturer's Standards with Premium Metal Flashing Drip Edge @ Base of Siding (Damp-Proof Flashing), on 1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, Provide Blocking Inside Sheathing For Vertical Siding Attachment, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
(REF: STRUCTURAL)

6 **Exterior Wall Assembly @ Metal Siding:**
22 ga. Kynar Coated Metal Panels on typical wall assembly as noted above. Color and Finish TBD

7 **Exterior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout pattern (provide samples) & heavy duty adjustable brick veneer anchors (spaced per Manufacturers Specifications), expansion joints (inside corners) and weep holes (Ref: Specifications), with 1" min. Airspace, Premium Metal Flashing & Counterflashings, Typ. & Premium Metal Dampproof Flashing, Typ. On Black Spray Applied Weather Resistant Barrier (Quality of Tremco Enviro-Dri), on Concrete / CMU Wall OR 1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
NOTE: SEE STRUCTURAL FOR CONCRETE STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

8 **Exterior Wall Assembly @ Concrete Avalanche Wall:**
Concrete Avalanche Wall (REF: STRUCTURAL);
Finish TBD

9 **Interior Wall Assembly @ Level 4 Smooth Drywall:**
Trim-less 5/8" Sheetrock with Painted Finish/Color TBD, on LEVEL 4 SMOOTH Mud-Work on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

10 **Interior Wall Assembly @ Wood Accent Wall:**
Trim-less Wood Accent Wall with hidden Fastener connections, Quality of Hewn Rustic Reclaimed (Verify Cedar or Hemlock), on 5/8" Sheetrock on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

11 **Interior Wall Assembly @ Steel Accent Wall:**
Pickled & Tarnished Blackened Steel Panels with Hidden Fastener Connections on Plywood Sheathing on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

12 **Interior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout (Provide Samples) & heavy duty adjustable veneer anchors (spaced per Manufacturers Specifications), on plywood sheathing on Typical Engineered 2x6 Stud Wall Wood Framing and/or Structural CMU/Concrete walls.
NOTE: SEE STRUCTURAL FOR CMU STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

13 **Interior Wall Assembly @ Tile Walls:**
Thin Set Tile on Bond Coat with Minimal Grout Lines, on Cement Backer Board, on Continuous Water Proof Membrane, on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ.

14 **Floor Assembly @ Unheated Wood Floors:**
Floor Finish (Ref: Finish Schedule), on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.
AT BRIDGE: Plate Steel occurs in lieu of Framing & Insulation

15 **Floor Assembly @ Unheated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

16 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Electric Heat Mat on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

17 **Floor Assembly @ Heated Concrete Floors:**
Concrete Finish TBD; 6" Concrete Structural Slab with Radiant Hydronic Heating, on Vapor Barrier, on 2" Rigid Insulation On Compacted Fill; REF & VERIFY W/ STRUCTURAL

18 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on 1 1/2" Lightweight Concrete with 2x2 Wood Sleepers on 16" O.C. Spacing (Wood Floor Nailer), with Radiant Heat Floors, on:
a) Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)
b) on Structural Concrete Slab

19 **Garage Floor Assembly:**
Reinforced Concrete Slab w/ Radiant Hydronic Heating,
REF: STRUCTURAL, On Vapor Barrier, 2" Rigid Insulation,
On Compacted Gravel Fill, Typ. Slope Concrete to Internal Catch Basin Drain Centered @ Garage Bay, Typ.

20 **Foundation Wall, Typ:**
2" Extruded polystyrene insulation (R-10), on Fluid Applied waterproofing, on Foundation/Retaining Wall, RE: Struct.

Above grade: Provide Premium Metal flashing over drainage/protection/ insulation board.

@ Basement & Avalanche Walls: Provide wood stud fur wall w/ blown in fiberglass insulation (R-15 min.) NO VAPOR BARRIER

Provide Perforated Perimeter Drain @
Base of Exterior Side of Foundation Wall / Footing, Typ.

21 **Floor Assembly @ Deck**
Stone Tile (Finish TBD with Samples), On Adjustable Pedestal System, on 80mm Fully Adhered EPDM Membrane Roofing, on Breathable Interlayment Per Manufacture's Specifications, over tapered extruded polystyrene (1/2" min.) as needed for positive drainage to internal roof drains, on Dens Deck, on Fully-Adhered Ice and Water Shield Underlayment over entire roof extents. Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ all curbs, wall transitions and roof edges, typ. Provide self-adhering ice and water shield up wall transitions up to 3'-0" min., over curbs & Provide a 3'-0" min overlap at all ridges, valleys, pitch changes to either side. On Structural Plywood Deck (NO OSB), on Engineered Wood Framing (REF: Structural). NO THERMAL BREAKS of the Structure.
21A - Interior: Stone Tile (Finish TBD with Samples), on Mortar Bed/ Lightweight Concrete prep, with Radiant Heat Floors, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.

22 **Floor Assembly @ Patio**
Sand Set Stone Tile (Finish TBD with Samples) Hydronic Heating TBD, REF: LANDSCAPE

23 **Floor Assembly @ Heated Concrete Pan Deck Slab:**
5" Concrete Pan Deck Slab w/ Radiant Hydronic Heating, on Floor Framing REF: STRUCTURAL

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5/4/23
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EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE
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ID 83340

DATE:	5/4/23
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Design Review	3.31.23
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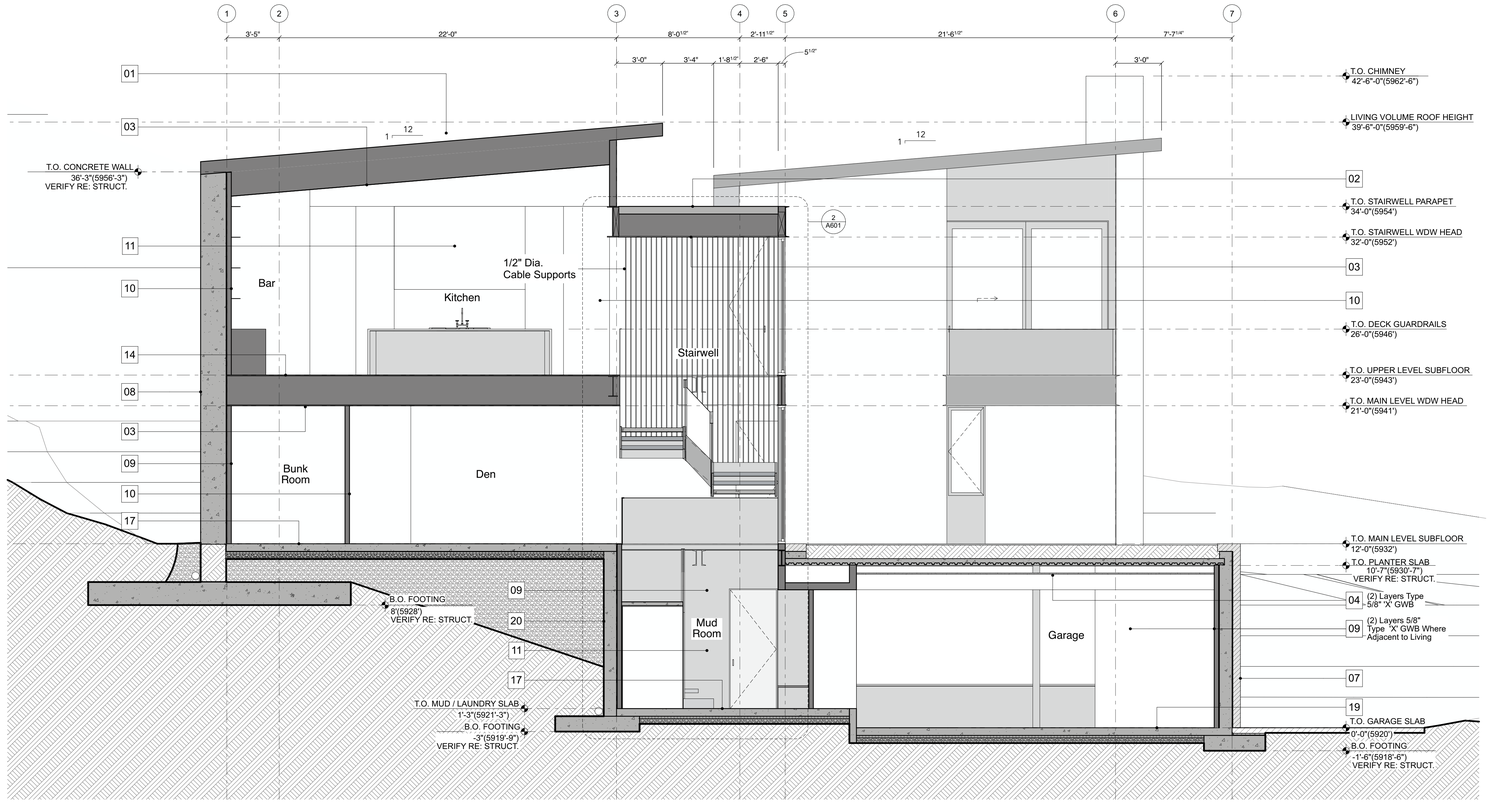
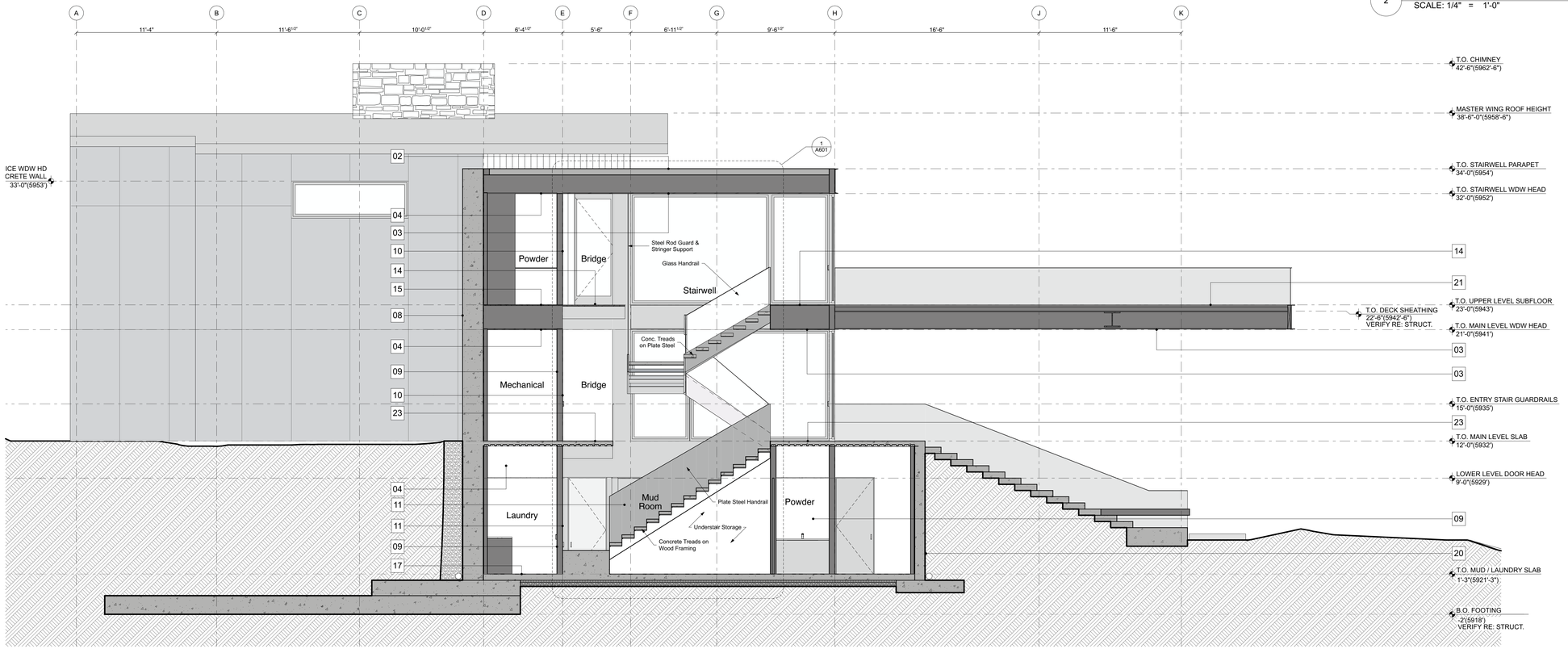
BUILDING SECTIONS



2 BUILDING SECTION
SCALE: 1/4" = 1'-0"



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

ASSEMBLY NOTES

1 **Shed Roof @ 1:12 Roof Pitch:**
Fully Adhered 80mm EPDM Roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on Fully-Adhered Ice and Water Shield Underlayment, on Plywood Sheathing, on Wood Sleeper / MPP Framing, on Plywood Sheathing, on pre-manufactured wood trusses OR "I" Joist rafter framing (Re: Struct) w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Roof Edges, typ. Provide snow retention system; to be coordinated with Architect, General Contractor, and Roofing Sub Contractor. Provide heat cable at edge of the roofline and gutters. NO THERMAL BREAKS of the Structure.

2 **Flat Roof @ Parapet Roof:**
Fully Adhered 80mm EPDM roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on tapered rigid insulation (1 1/2" min.) w/ 0.25:12 slope, on DensDeck, on Fully-Adhered Ice and Water Shield Underlayment, on plywood roof sheathing, on I joist framing, Re: Struct., w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Curbs, Wall Transitions and Roof Edges, typ. Provide self-adhering ice and water shield up all Wall transitions 3'-0" min., over curbs & overlap all valleys 3'-0" min. to either side. See roof plan for roof slope and drain/downspout locations. Provide heat cable at all downspouts and scuppers. NO THERMAL BREAKS of the Structure.

3 **Exterior & Interior Soffit:**
Trim-less 1x6 T&G 1/16" Shadowline Joint, Quality of TBD (Or Alternative Provided by Poster), with Hidden Fastener Connection to Structural Frame Above.

4 **Interior Ceiling:**
Level 4 Sheetrock Painted Finish/Color, TBD, Trim-less 5/8" Sheetrock with LEVEL 4 SMOOTH Mud-Work on
Ceiling Framing Framing, with Sound-Batt Noise Insulation @
1st & 2nd Levels, Typ; Verify Glass Mat / Waterproofing w/ RCP

5 **Exterior Wall Assembly @ Wood Siding:**
Vertical Trim-less 1x6 T&G Butt Joint, Quality of Hewn Rustic Reclaimed, (Or Alternative Provided by Poster), on Commercial Grade Drainage Wrap, Quality of Benjamin Obdyke HydroGap, (Or Alternate Provided by Poster) per Manufacturer's Standards with Premium Metal Flashing Drip Edge @ Base of Siding (Damp-Proof Flashing), on 1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, Provide Blocking Inside Sheathing For Vertical Siding Attachment, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
(REF: STRUCTURAL)

6 **Exterior Wall Assembly @ Metal Siding:**
22 ga. Kynar Coated Metal Panels on typical wall assembly as noted above. Color and Finish TBD

7 **Exterior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout pattern (provide samples) & heavy duty adjustable brick veneer anchors (spaced per Manufacturers Specifications), expansion joints (inside corners) and weep holes (Ref: Specifications), with 1" min. Airspace, Premium Metal Flashing & Counterflashings, Typ. & Premium Metal Dampproof Flashing, Typ. On Black Spray Applied Weather Resistant Barrier (Quality of Tremco Enviro-Dri), on Concrete / CMU Wall OR
1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
NOTE: SEE STRUCTURAL FOR CONCRETE STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

8 **Exterior Wall Assembly @ Concrete Avalanche Wall:**
Concrete Avalanche Wall (REF: STRUCTURAL);
Finish TBD

9 **Interior Wall Assembly @ Level 4 Smooth Drywall:**
Trim-less 5/8" Sheetrock with Painted Finish/Color TBD, on LEVEL 4 SMOOTH Mud-Work on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

10 **Interior Wall Assembly @ Wood Accent Wall:**
Trim-less Wood Accent Wall with hidden Fastener connections, Quality of Hewn Rustic Reclaimed (Verify Cedar or Hemlock), on 5/8" Sheetrock on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

11 **Interior Wall Assembly @ Steel Accent Wall:**
Pickled & Tarnished Blackened Steel Panels with Hidden Fastener Connections on Plywood Sheathing on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

12 **Interior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout (Provide Samples) & heavy duty adjustable veneer anchors (spaced per Manufacturers Specifications), on plywood sheathing on Typical Engineered 2x6 Stud Wall Wood Framing and/or Structural CMU/Concrete walls.
NOTE: SEE STRUCTURAL FOR CMU STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

13 **Interior Wall Assembly @ Tile Walls:**
Thin Set Tile on Bond Coat with Minimal Grout Lines, on Cement Backer Board, on Continuous Water Proof Membrane, on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ.

14 **Floor Assembly @ Unheated Wood Floors:**
Floor Finish (Ref: Finish Schedule), on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.
AT BRIDGE: Plate Steel occurs in lieu of Framing & Insulation

15 **Floor Assembly @ Unheated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

16 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Electric Heat Mat .on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

17 **Floor Assembly @ Heated Concrete Floors:**
Concrete Finish TBD; 6" Concrete Structural Slab with Radiant Hydronic Heating, on Vapor Barrier, on 2" Rigid Insulation On Compacted Fill; REF & VERIFY W/ STRUCTURAL

18 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on 1 1/2" Lightweight Concrete with 2x2 Wood Sleepers on 16" O.C. Spacing (Wood Floor Nailer), with Radiant Heat Floors, on:
a) Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)
b) on Structural Concrete Slab

19 **Garage Floor Assembly:**
Reinforced Concrete Slab w/ Radiant Hydronic Heating,
REF: STRUCTURAL, On Vapor Barrier, 2" Rigid Insulation,
On Compacted Gravel Fill, Typ. Slope Concrete to Internal Catch Basin Drain Centered @ Garage Bay, Typ.

20 **Foundation Wall, Typ:**
2" Extruded polystyrene insulation (R-10), on Fluid Applied waterproofing, on Foundation/Retaining Wall, RE: Struct.

Above grade: Provide Premium Metal flashing over drainage/protection/ insulation board.

@ Basement & Avalanche Walls: Provide wood stud fur wall w/ blown in fiberglass insulation (R-15 min.) NO VAPOR BARRIER

Provide Perforated Perimeter Drain @
Base of Exterior Side of Foundation Wall / Footing, Typ.

21 **Floor Assembly @ Deck**
Stone Tile (Finish TBD with Samples), On Adjustable Pedestal System, on 80mm Fully Adhered EPDM Membrane Roofing, on Breathable Interlayment Per Manufacture's Specifications, over tapered extruded polystyrene (1/2" min.) as needed for positive drainage to internal roof drains, on Dens Deck, on Fully-Adhered Ice and Water Shield Underlayment over entire roof extents. Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ all curbs, wall transitions and roof edges, typ. Provide self-adhering ice and water shield up wall transitions up to 3'-0" min., over curbs & Provide a 3'-0" min overlap at all ridges, valleys, pitch changes to either side. On Structural Plywood Deck (NO OSB), on Engineered Wood Framing (REF: Structural). NO THERMAL BREAKS of the Structure.
21A - Interior: Stone Tile (Finish TBD with Samples), on Mortar Bed/ Lightweight Concrete prep, with Radiant Heat Floors, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.

22 **Floor Assembly @ Patio**
Sand Set Stone Tile (Finish TBD with Samples) Hydronic Heating TBD, REF: LANDSCAPE

23 **Floor Assembly @ Heated Concrete Pan Deck Slab:**
5" Concrete Pan Deck Slab w/ Radiant Hydronic Heating, on Floor Framing REF: STRUCTURAL

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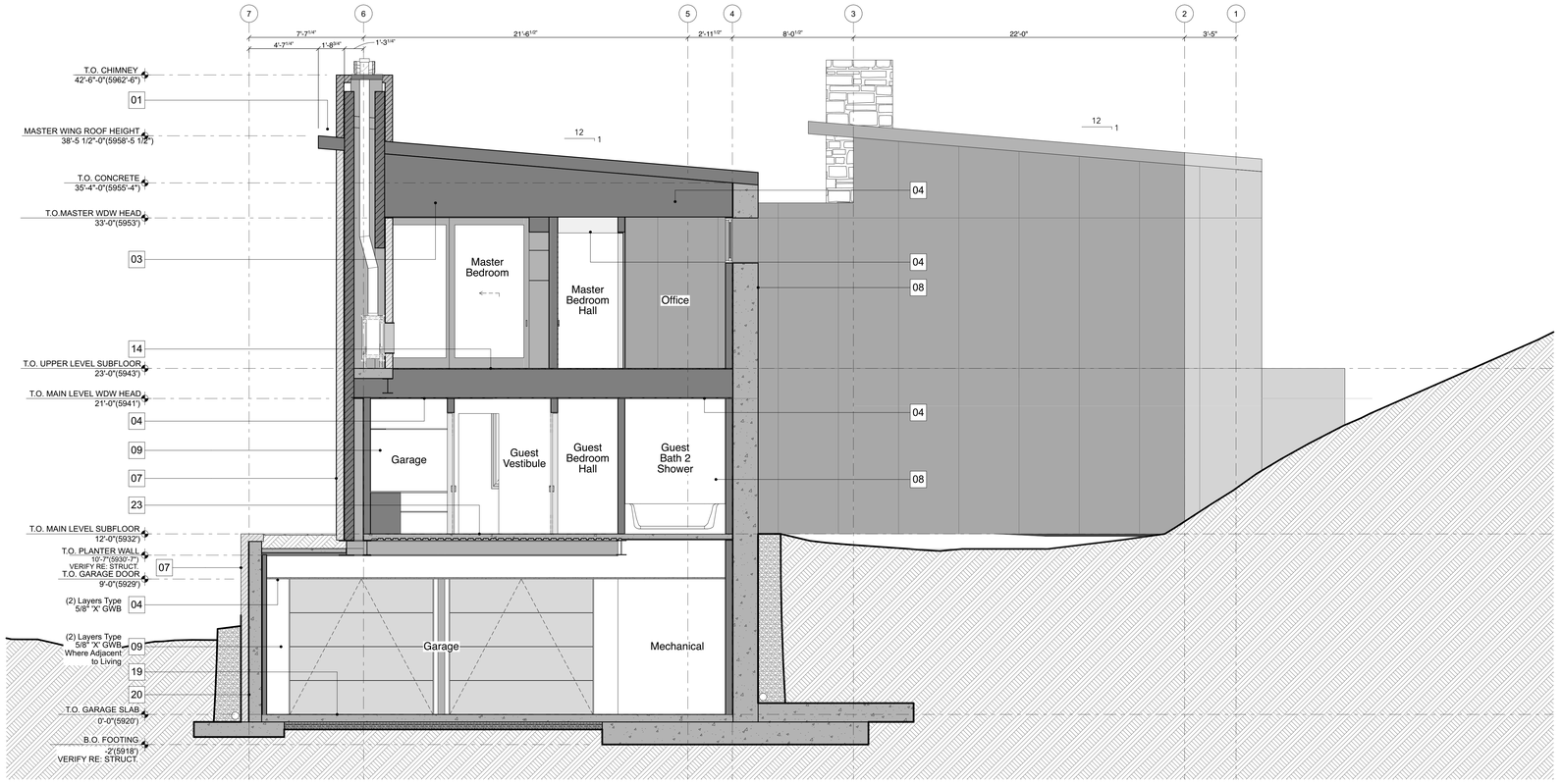
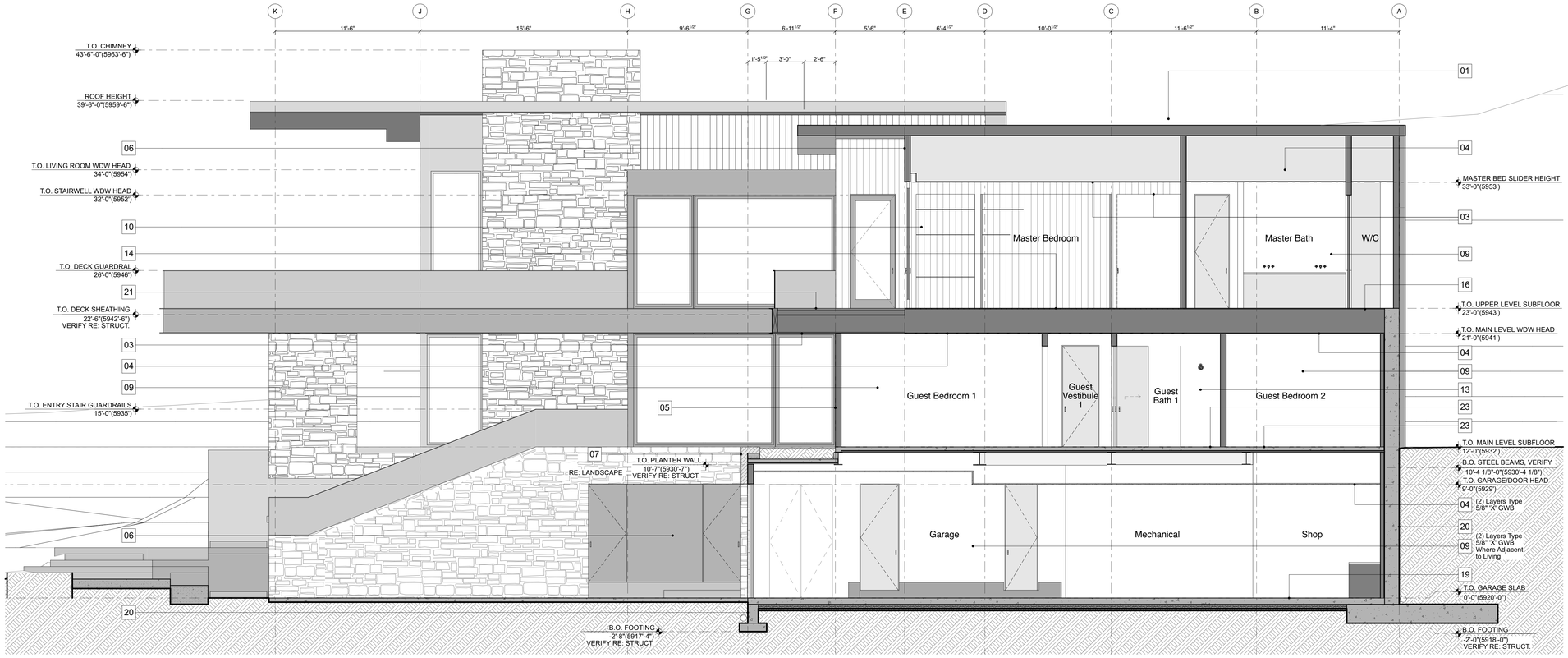
A401

BUILDING SECTIONS



2 BUILDING SECTION
SCALE: 1/4" = 1'-0"



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

ASSEMBLY NOTES

1 **Shed Roof @ 1:12 Roof Pitch:**
Fully Adhered 80mm EPDM Roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on Fully-Adhered Ice and Water Shield Underlayment, on Plywood Sheathing, on Wood Sleeper / MPP Framing, on Plywood Sheathing, on pre-manufactured wood trusses OR "I" Joist rafter framing (Re: Struct) w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Roof Edges, typ. Provide snow retention system; to be coordinated with Architect, General Contractor, and Roofing Sub Contractor. Provide heat cable at edge of the roofline and gutters. NO THERMAL BREAKS of the Structure.

2 **Flat Roof @ Parapet Roof:**
Fully Adhered 80mm EPDM roofing membrane, on Breathable Interlayment per Manufacturer's Specifications, on tapered rigid insulation (1 1/2" min.) w/ 0.25:12 slope, on DensDeck, on Fully-Adhered Ice and Water Shield Underlayment, on plywood roof sheathing, on I joist framing, Re: Struct., w/ closed cell polyurethane spray foam insulation (R-60 Min.) Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ All Curbs, Wall Transitions and Roof Edges, typ. Provide self-adhering ice and water shield up all Wall transitions 3'-0" min., over curbs & overlap all valleys 3'-0" min. to either side. See roof plan for roof slope and drain/downspout locations. Provide heat cable at all downspouts and scuppers. NO THERMAL BREAKS of the Structure.

3 **Exterior & Interior Soffit:**
Trim-less 1x6 T&G 1/16" Shadowline Joint, Quality of TBD (Or Alternative Provided by Poster), with Hidden Fastener Connection to Structural Frame Above.

4 **Interior Ceiling:**
Level 4 Sheetrock Painted Finish/Color, TBD, Trim-less 5/8" Sheetrock with LEVEL 4 SMOOTH Mud-Work on
Ceiling Framing Framing, with Sound-Batt Noise Insulation @
1st & 2nd Levels, Typ; Verify Glass Mat / Waterproofing w/ RCP

5 **Exterior Wall Assembly @ Wood Siding:**
Vertical Trim-less 1x6 T&G Butt Joint, Quality of Hewn Rustic Reclaimed, (Or Alternative Provided by Poster), on Commercial Grade Drainage Wrap, Quality of Benjamin Obdyke HydroGap, (Or Alternate Provided by Poster) per Manufacturer's Standards with Premium Metal Flashing Drip Edge @ Base of Siding (Damp-Proof Flashing), on 1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, Provide Blocking Inside Sheathing For Vertical Siding Attachment, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
(REF: STRUCTURAL)

6 **Exterior Wall Assembly @ Metal Siding:**
22 ga. Kynar Coated Metal Panels on typical wall assembly as noted above. Color and Finish TBD

7 **Exterior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout pattern (provide samples) & heavy duty adjustable brick veneer anchors (spaced per Manufacturers Specifications), expansion joints (inside corners) and weep holes (Ref: Specifications), with 1" min. Airspace, Premium Metal Flashing & Counterflashings, Typ. & Premium Metal Dampproof Flashing, Typ. On Black Spray Applied Weather Resistant Barrier (Quality of Tremco Enviro-Dri), on Concrete / CMU Wall OR
1/2" Plywood Sheathing (no OSB), on Typical Engineered 2x6 Stud Wall Wood Framing, with closed cell polyurethane spray foam insulation (full depth of Stud), (R-35 Min.) Typ.
NOTE: SEE STRUCTURAL FOR CONCRETE STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

8 **Exterior Wall Assembly @ Concrete Avalanche Wall:**
Concrete Avalanche Wall (REF: STRUCTURAL);
Finish TBD

9 **Interior Wall Assembly @ Level 4 Smooth Drywall:**
Trim-less 5/8" Sheetrock with Painted Finish/Color TBD, on
LEVEL 4 SMOOTH Mud-Work on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

10 **Interior Wall Assembly @ Wood Accent Wall:**
Trim-less Wood Accent Wall with hidden Fastener connections, Quality of Hewn Rustic Reclaimed (Verify Cedar or Hemlock), on 5/8" Sheetrock on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

11 **Interior Wall Assembly @ Steel Accent Wall:**
Pickled & Tarnished Blackened Steel Panels with Hidden Fastener Connections on Plywood Sheathing on Typical Engineered 2x6 Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ.

12 **Interior Wall Assembly @ Stone Veneer:**
Atlas Granite Select Stone w/ Standard Grey Grout (Provide Samples) & heavy duty adjustable veneer anchors (spaced per Manufacturers Specifications), on plywood sheathing on Typical Engineered 2x6 Stud Wall Wood Framing and/or Structural CMU/Concrete walls.
NOTE: SEE STRUCTURAL FOR CMU STONE SHELF WALL & FOOTING DETAIL FOR SUPPORTING STONE, TYP.

13 **Interior Wall Assembly @ Tile Walls:**
Thin Set Tile on Bond Coat with Minimal Grout Lines, on Cement Backer Board, on Continuous Water Proof Membrane, on Typical Engineered Wood Stud Framing, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ.

14 **Floor Assembly @ Unheated Wood Floors:**
Floor Finish (Ref: Finish Schedule), on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.
AT BRIDGE: Plate Steel occurs in lieu of Framing & Insulation

15 **Floor Assembly @ Unheated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

16 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on Electric Heat Mat ,on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)

17 **Floor Assembly @ Heated Concrete Floors:**
Concrete Finish TBD; 6" Concrete Structural Slab with
Radiant Hydronic Heating, on Vapor Barrier, on 2" Rigid Insulation
On Compacted Fill; REF & VERIFY W/ STRUCTURAL

18 **Floor Assembly @ Heated Tile Floors:**
ThinSet Tile Floors per Manufacturer's Install Specifications with minimal grout lines, on 1 1/2" Lightweight Concrete with 2x2 Wood Sleepers on 16" O.C. Spacing (Wood Floor Nailer), with Radiant Heat Floors, on:
a) Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ. (Provide Waterproof Pan, with Waterproof Membrane, and Mortar beds sloping to linear drains at Shower, Typ. - NO WOOD SLEEPERS)
b) on Structural Concrete Slab

19 **Garage Floor Assembly:**
Reinforced Concrete Slab w/ Radiant Hydronic Heating,
REF: STRUCTURAL, On Vapor Barrier, 2" Rigid Insulation,
On Compacted Gravel Fill, Typ. Slope Concrete to Internal Catch Basin Drain Centered @ Garage Bay, Typ.

20 **Foundation Wall, Typ:**
2" Extruded polystyrene insulation (R-10), on Fluid Applied waterproofing, on Foundation/Retaining Wall, RE: Struct.

Above grade: Provide Premium Metal flashing over drainage/protection/ insulation board.

@ Basement & Avalanche Walls: Provide wood stud fur wall w/ blown in fiberglass insulation (R-15 min.) NO VAPOR BARRIER

Provide Perforated Perimeter Drain @
Base of Exterior Side of Foundation Wall / Footing, Typ.

21 **Floor Assembly @ Deck**
Stone Tile (Finish TBD with Samples), On Adjustable Pedestal System, on 80mm Fully Adhered EPDM Membrane Roofing, on Breathable Interlayment Per Manufacture's Specifications, over tapered extruded polystyrene (1/2" min.) as needed for positive drainage to internal roof drains, on Dens Deck, on Fully-Adhered Ice and Water Shield Underlayment over entire roof extents. Provide Premium Metal Hemmed Drip Edge Flashing/ Counter Flashing @ all curbs, wall transitions and roof edges, typ. Provide self-adhering ice and water shield up wall transitions up to 3'-0" min., over curbs & Provide a 3'-0" min overlap at all ridges, valleys, pitch changes to either side. On Structural Plywood Deck (NO OSB), on Engineered Wood Framing (REF: Structural). NO THERMAL BREAKS of the Structure.
21A - Interior: Stone Tile (Finish TBD with Samples), on Mortar Bed/ Lightweight Concrete prep, with Radiant Heat Floors, on Plywood Floor Deck (NO OSB), on Engineered Wood Framing, REF: STRUCTURAL, with Sound-Batt Noise Insulation Throughout, Typ.

22 **Floor Assembly @ Patio**
Sand Set Stone Tile (Finish TBD with Samples) Hydronic Heating TBD, REF: LANDSCAPE

23 **Floor Assembly @ Heated Concrete Pan Deck Slab:**
5" Concrete Pan Deck Slab w/ Radiant Hydronic Heating,
on Floor Framing REF: STRUCTURAL

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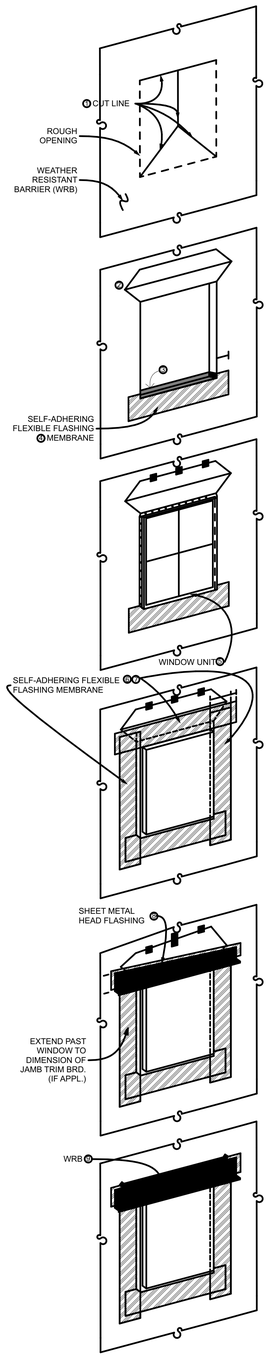
A402
BUILDING SECTIONS

VS



WINDOW INSTALLATION DETAILS
- WRB INSTALLED PRIOR TO WINDOW
- STRUCTURAL, INTEGRAL NAILING FIN
- REFER ALSO TO ASTM E2112 & MFGR. INSTALLATION INSTRUCTIONS

1) MAKE A MODIFIED "I" CUT IN THE WRB (SEE CUT LINE), THEN WRAP WRB TO INTERIOR AT SILL AND JAMBS AND STAPLE IN PLACE.

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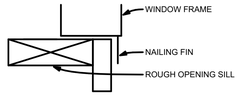
3) POSITION SO THAT WINDOW DEPTH CAN BE ACCOMODATED PLUS 1/2".



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5) A. INSERT WINDOW INTO OPENING. CENTER UNIT IN ROUGH OPENING. CHECK THE UNIT FOR LEVEL ACROSS HEAD (WINDOW MUST BE LOCKED). SHIM SILL UNTIL LEVEL AT BOTTOM OF JAMBS, BOTTOM OF VERTICAL MULLION, OR BOTTOM OF MEETING STILE.

B. NAIL OR SCREW CORNERS IN EACH DIRECTION (3" TO 10" FROM CORNER).

C. PLUMB JAMBS & CHECK DIAGONAL MEASUREMENTS. SHIM SIDE JAMBS IN CENTER TO MAINTAIN SAME WIDTH AS TOP AND BOTTOM OF UNIT.

D. FINISH NAILING AROUND PERIMETER OF UNIT W/ FASTENERS AT 16" O.C. (MAX) FASTENERS INSTALLED AT HEAD OF WINDOW SHALL ALLOW FOR DEFLECTION OF HEAD BEAM WITHOUT DEFLECTION OF WINDOW HEAD.

E. SHIM SILL SO IT IS SUPPORTED IN STRAIGHT AND LEVEL CONDITION AT MINIMUM OF THREE POINTS. SPACE SHIMS 12" MAX.

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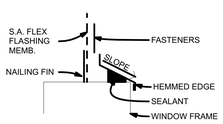

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Window Schedule

ID	Type	W x H	Sill Height	Head	Jam	Sill	Manufacturer	Notes/Remarks
A	Fixed	4'-6"×9'-0"	0"				Glo	
B	Fixed	4'-6"×9'-0"	0"				Glo	
C	Fixed	4'-6"×9'-0"	0"				Glo	
D	Fixed	4'-9"×9'-0"	0"				Glo	
E	Fixed	4'-9"×9'-0"	0"				Glo	
F	Fixed	11'-3"×9'-0"	0"				Glo	
G	Fixed	11'-3"×9'-0"	0"				Glo	
H	Casement	2'-6"×6'-0"	3'-0"				Glo	Tilt & Turn
J	Fixed	5'-0"×6'-0"	3'-0"				Glo	
K	Fixed	5'-0"×6'-0"	3'-0"				Glo	
L	Casement	4'-0"×6'-0"	3'-0"				Glo	Tilt & Turn
M	Fixed	4'-2"×11'-0"	0"				Glo	
N	Fixed	5'-3"×11'-0"	0"				Glo	
P	Fixed	4'-8 1/4"×11'-0"	0"				Glo	
Q	Casement	1'-8"×8'-0"	3'-0"				Glo	
R	Fixed	4'-0"×11'-0"	0"				Glo	
S	Fixed	9'-5"×3'-0"	7'-0"				Glo	
T	Fixed	5'-0"×10'-0"	0"				Glo	
U	Fixed	5'-0"×10'-0"	0"				Glo	
V	Fixed	4'-0"×10'-0"	0"				Glo	

NOTE: All windows have max. U-Value = 0.32

GENERAL NOTE: REFER TO NOTED PLANS FOR LOCATIONS WHERE TEMPERED GLAZING OCCURS.

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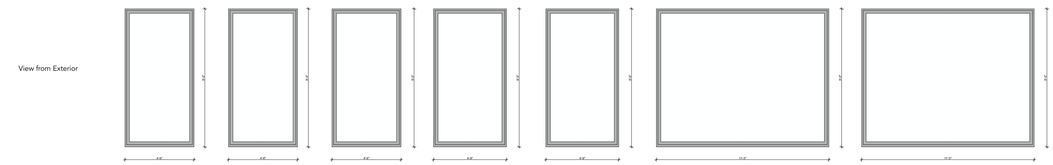

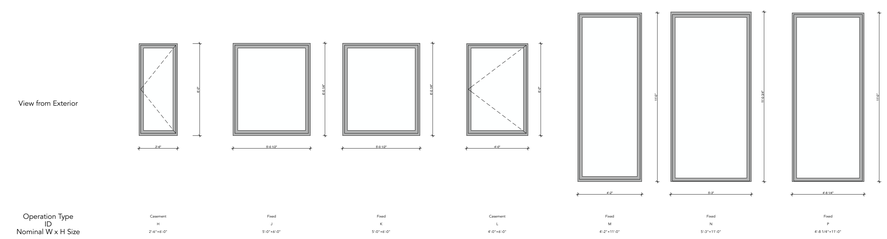

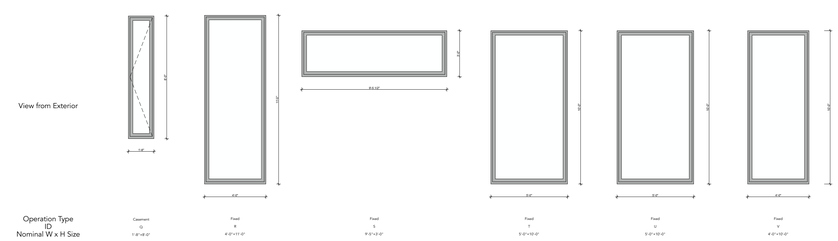

Exterior Door and Window Notes

01. Frame Size and location of each window is depicted from the top of subfloor. Intent is to align T.O. Window Units w/ T.O. Exterior Doors in all cases. Head height indicates rough opening height for window/door, SEE WINDOW/DOOR DETAIL FOR MORE INFORMATION. Also Door Height on schedule indicates leaf size and not unit size, please consult architect for any questions.

02. Manufacturer shall submit shop drawings, tabulations, and rough opening sizes to Owner for review.

03. Verify exterior cladding color with Owner.

04. All glazing shall be Low-E 2 sealed insulating glass unless noted otherwise. Where required by code, glazing shall be tempered.

05. All window/door type elevations are drawn as viewed from the exterior.

06. Window/Door hardware to be determined.

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ARCHITECT STAMP

LICENSED ARCHITECT AR 986479
5/4/23
Scott Payne
STATE OF IDAHO
EXP: 6.25.23

DESIGN REVIEW SET

PRATT RESIDENCE

406 SAGE RD, KETCHUM ID 83340

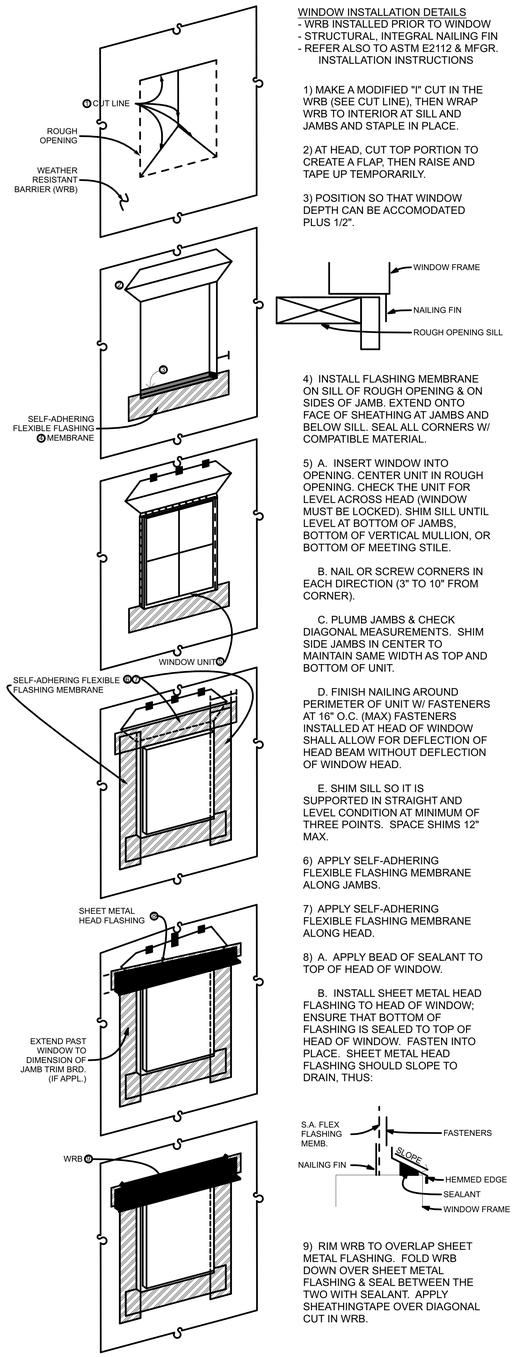
DATE:	5/4/23
PROJECT #:	SV2202
DRAWN:	NH/AB

ISSUE:

Design Review	3.31.23
Design Review Response	

A701
WINDOW SCHEDULES / ELEVATIONS

V5



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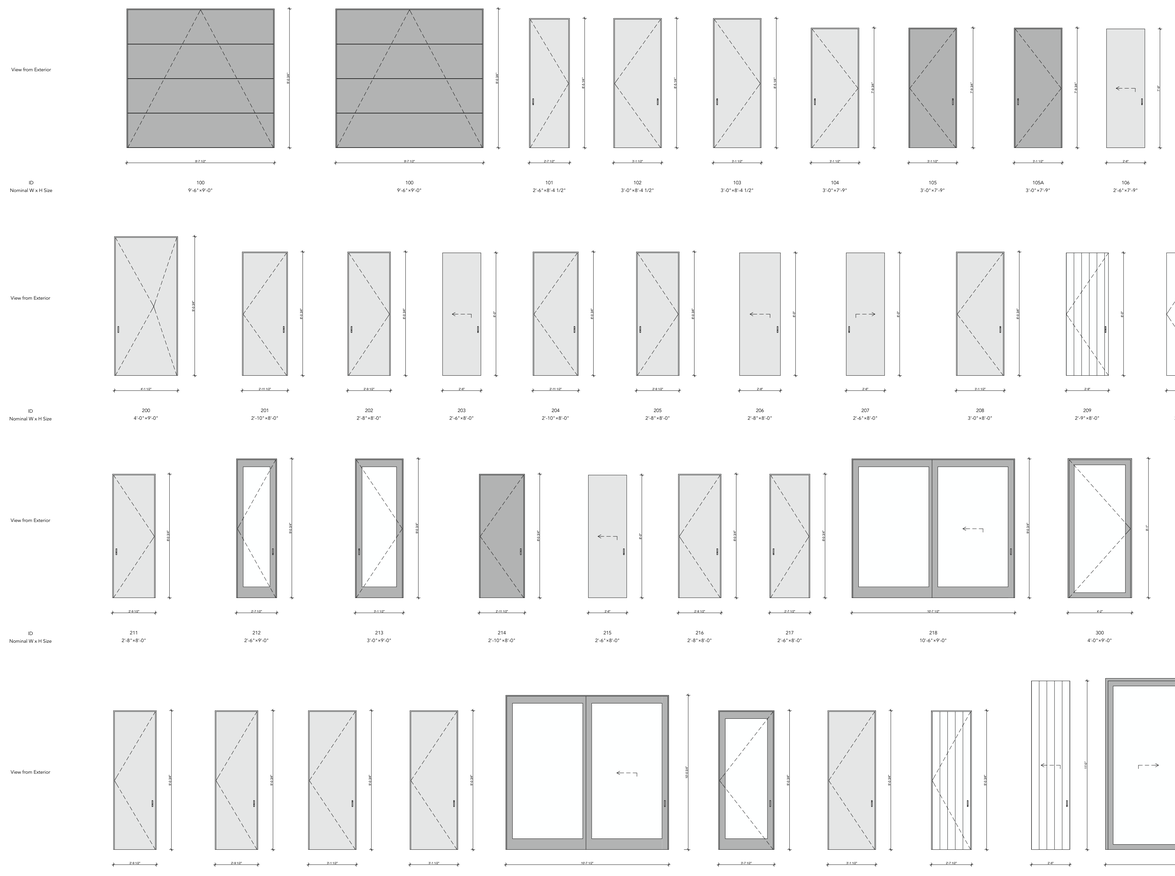
Exterior Door Schedule

ID	Operation	Location	W x H	Head	Jam	Sill	Manufacturer	Notes/Remarks
100	Overhead	Garage	9'-6"×9'-0"				TBD	
100	Overhead	Garage	9'-6"×9'-0"				TBD	
101	Swinging	Elevator Maintenance Access	2'-6"×8'-4 1/2"				TBD	Verify Fire Rating Requirements
102	Swinging	Garage	3'-0"×8'-4 1/2"				TBD	Self-Closing 1 3/4" Solid Wood/Steel Door or 20-Minute Fire-Rated Door.
103	Swinging	Elevator	3'-0"×8'-4 1/2"				TBD	Elevator Man Door; Verify with Elevator Manufacturer
104	Swinging	Laundry	3'-0"×7'-9"				TBD	
105	Swinging	Mud Room	3'-0"×7'-9"				TBD	Exterior Door - Clad to Match Exterior Siding, Verify
105A	Swinging	Spa Maintenance / Mech.	3'-0"×7'-9"				TBD	Exterior Door - Clad to Match Exterior Siding, Verify
106	Pocket	Powder	2'-6"×7'-9"				TBD	
200	Pivot	Entry Foyer	4'-0"×9'-0"				TBD	Exterior
201	Swinging	Guest Bedroom Hall	2'-10"×8'-0"				TBD	
202	Swinging	Guest Bath 2	2'-8"×8'-0"				TBD	
203	Pocket	Guest Bath 2	2'-6"×8'-0"				TBD	
204	Swinging	Guest Vestibule 1	2'-10"×8'-0"				TBD	
205	Swinging	Guest Vestibule 1	2'-8"×8'-0"				TBD	
206	Pocket	Guest Bath 1	2'-8"×8'-0"				TBD	
207	Pocket	Guest Bath 1	2'-6"×8'-0"				TBD	
208	Swinging	Elevator	3'-0"×8'-0"				TBD	Elevator Man Door; Verify with Elevator Manufacturer
209	Swinging	Mechanical	2'-9"×8'-0"				TBD	Outside Face Clad to Match Adjacent Wood Siding In Bridge
210	Swinging	Den Bath	2'-8"×8'-0"				TBD	Frosted Glass: Re: Interiors
211	Pocket	Bunk Room	2'-8"×8'-0"				TBD	
212	Swinging	Bunk Room	2'-6"×9'-0"				TBD	Exterior, Full-Lite
213	Swinging	Den	3'-0"×9'-0"				TBD	Exterior, Full-Lite
214	Swinging	Jr. Master Vestibule	2'-10"×8'-0"				TBD	Built to Match Exterior Wood Siding
215	Pocket	Jr. Master Closet	2'-6"×8'-0"				TBD	
216	Swinging	Jr. Master Bath	2'-8"×8'-0"				TBD	
217	Swinging	Jr. Master Bath	2'-6"×8'-0"				TBD	
218	XO Two-Panel Slider	Jr. Master	10'-6"×9'-0"				Glo	Exterior, Full-Lite
300	Swinging	Upper Stair	4'-0"×9'-0"				TBD	Exterior, Full-Lite
301	Pocket	Master Bath	2'-8"×9'-0"				TBD	
302	Swinging	Master Bath	2'-8"×9'-0"				TBD	
303	Swinging	Her Closet	2'-8"×9'-0"				TBD	
304	Swinging	His Closet	2'-8"×9'-0"				TBD	
305	Swinging	Master Bedroom	3'-0"×9'-0"				TBD	
306	Swinging	Office	3'-0"×9'-0"				TBD	
307	XO Two-Panel Slider	Master Patio	10'-6"×10'-0"				Glo	Exterior, Full-Lite
308	Swinging	Master Hall	3'-6"×9'-0"				Glo	Exterior, Full-Lite
309	Swinging	Elevator	3'-0"×9'-0"				TBD	Elevator Man Door; Verify with Elevator Manufacturer
310	Swinging	Powder	2'-6"×9'-0"				TBD	Built to Match Exterior Wood Siding
311	Pocket	Pantry	2'-6"×11'-0"				TBD	
313	XO Two-Panel Slider	Outdoor Living	15'-6"×11'-0"				Glo	Exterior, Full-Lite



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02. Manufacturer shall submit shop drawings, tabulations, and rough opening sizes to Owner for review.

03. Verify exterior cladding color with Owner.

04. All glazing shall be Low-E 2 sealed insulating glass unless noted otherwise. Where required by code, glazing shall be tempered.

Exterior Door and Window Notes

05. All window/door type elevations are drawn as viewed from the exterior.

06. Window/Door hardware to be determined.

Interior Door Notes

01. Frame Size and location of each window is depicted from the top of subfloor (Doors and Windows numbering 100) subloor El =101'-0" at main level. Intent is to align Interior Doors with T.O. Window Units or T.O. Exterior Doors in most cases. Head height indicates mounting height for window/door, SEE INTERIOR DOOR DETAILS FOR MORE INFORMATION.

02. Manufacturer shall submit shop drawings, tabulations, and verifed in field rough opening sizes to Owner for review.

03. See Door Elevation for information on look and style of door.

GENERAL NOTE: REFER TO NOTED PLANS FOR LOCATIONS WHERE TEMPERED GLAZING OCCURS.

NOTE: All windows have max. U-Value = 0.32

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A702
DOOR SCHEDULES / ELEVATIONS

VS

STRUCTURAL SPECIFICATION

SPECIAL INSPECTIONS

IBC 2018, TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARD (a)	IBC REFERENCE
1. Inspection of reinforcing steel, including pre-stressing tendons, and placement.	-	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. Inspection of reinforcing steel welding in accordance with table 1705.2.2, item 2b.	-	-	AWS D1.4 ACI 318: 26.6.4	-
3. Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used.	-	X	ACI 318: 17.8.2	-
4. Inspection of anchors post installed in hardened concrete members.	-	X	ACI 318: 17.8.24, 17.8.2	-
5. Verifying use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C 172 ASTM C 31 ACI 318: 25.5, 26.12	1908.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. Inspection for maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X X	- -	ACI 318: 26.10	-
10. Erection of precast concrete members.	-	X	ACI 318: 26.9	-
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.11.2	-
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.11.1.2(b)	-

a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

AISC 360-16 CHAPTER N
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

WELDING INSPECTION TASK	TABLE REFERENCE
PRIOR TO WELDING	TABLE N5.4-1
DURING TO WELDING	TABLE N5.4-2
AFTER TO WELDING	TABLE N5.4-3
BOLTING INSPECTION TASK	
PRIOR TO BOLTING	TABLE N5.6-1
DURING TO BOLTING	TABLE N5.6-2
AFTER TO BOLTING	TABLE N5.6-3

AISC 341-16 CHAPTER J
REQUIRED VERIFICATION AND INSPECTION OF SEISMIC STEEL MOMENT FRAMES AND BRACED FRAMES

WELDING INSPECTION TASK	TABLE REFERENCE
PRIOR TO WELDING	TABLE J6.1
DURING TO WELDING	TABLE J6.2
AFTER TO WELDING	TABLE J6.3
BOLTING INSPECTION TASK	
PRIOR TO BOLTING	TABLE J7.1
DURING TO BOLTING	TABLE J7.2
AFTER TO BOLTING	TABLE J7.3

GENERAL NOTES

The General Contractor shall verify all existing site conditions and coordinate dimensions among all drawings prior to proceeding with any work or off site fabrication.

Any discrepancies found among the drawings, specifications and notes shall be reported to the Engineer Of Record for clarification.

Contractor to submit a request to Engineer for any substitution of materials or products specified in the contract drawings or specifications.

Contractor to provide shop drawings to the Engineer for review prior to the fabrication and erection of the following items: Structurally Insulated Panels (SIP's), Structural Steel and Miscellaneous Metals, Manufactured Wood Joists and Trusses.

Holes, notching or other penetrations through structural members shall not be permitted without prior Engineer approval.

It is the responsibility of the General Contractor for safety and protection within and adjacent to the job site.

CONCRETE & REINFORCEMENT

CONCRETE
Structural concrete shall be of normal weight concrete (145pcf) with a maximum aggregate size of 3/4" conforming to ASTM C 33, and shall meet the following criteria:

LOCATION	MINIMUM 28day COMPRESSIVE STRENGTH, psi	MAXIMUM WATER-CEMENT RATIO (b)	MAXIMUM SLUMP, inches (a)	AIR-ENTRAINMENT PERCENT ± 1.5%	CEMENT TYPE
ALL STRUCTURAL CONCRETE	4500	.50	4	6	II

a) Maximum slump based on maximum water-cementitious ratio. Mid and high range water reducing agents can be used to increase slump beyond these maximums with Approval of Engineer.
b) Water shall not be added at the job site such that the water-cementitious ratio is exceeded.

CONCRETE BATCHING, MIXING, TRANSPORTATION, PLACEMENT, CONSOLIDATION, HOT & COLD WEATHER PROTECTION
Concrete batching, mixing, and transportation shall conform to ACI 304R.
Cement to conform to ASTM C 150.
Aggregates to conform to ASTM C 33.
Water shall conform to ACI 318-3A.
Placing of concrete shall conform to ACI 304R and ACI 318-5.10.
Pumping of concrete shall conform to ACI 304.2R.
No more than 90 minutes shall elapse between batching and placement of concrete.
Form work shall conform to ACI 347R and ACI 318-6.1.
Reinforcing steel and Embedded items shall be clean and free of foreign debris and be tied securely in place and care taken not to displace during concrete placement.
Conduits and Pipes shall not be embedded in concrete without Engineers written approval.
Consolidation of concrete shall conform to ACI 309R. The unconfined fall of concrete shall not exceed 5'-0".
Hot weather concreting shall conform to ACI 305R.
Cold weather concreting shall conform to ACI 306R.
Concrete shall not be placed on disturbed soil, frozen soil, or placed in water.
Forms shall not be stripped from walls and footings until concrete strength reaches a minimum of 1000psi. Forms supporting suspended slabs shall not be stripped until full 28day specified compressive strength is achieved.

CONCRETE WALLS
Provide dowels from footing to wall to match vertical reinforcement size, spacing and location with embed hooks minimum 12 bar diameters in length, U.O.N.

Provide corner bars with 2'-0" long legs to match horizontal reinforcement size, spacing and location unless otherwise noted in drawings. Lap splice horizontal steel full length with corner bars.

Reinforcing steel shall be continuous through all cold joints.

Stem walls shall not be back filled until main floor is framed and sheathed, and concrete has cured a minimum 7 days.

Provide adequate drainage behind walls as required to prevent standing water behind walls.

Anchor bolts shall be ASTM F1554 Grade 36 and of the size and spacing as indicated on the drawings and have a 7" minimum embedment depth. Anchor bolts to be within 1'-0" of all plate ends, with a minimum of two per wall, and closer than 6" from concrete wall corners.

CONCRETE SLABS ON GRADE
Unless otherwise noted on drawings, concrete slabs on grade to be minimum 6" thick, reinforced with #4 @ 12"o.c. each way placed at slab centerline.

Slabs to be placed over 6" thick compacted gravel base over undisturbed or compacted native strata.

All surfaces of construction joints shall be free of dust, chips and foreign matter prior to casting adjacent slab. Reinforcement shall be continuous through construction and crack control joints.

Provide 3/8" thick expansion joint material and sealant between slab edges and abutting walls and columns unless otherwise noted on the drawings.

Provide 3/4" deep tooled or saw-cut crack control joints at a maximum of 15'-0" apart in both directions. Fill joint with and elastomeric sealant. Contractor to submit to the Architect/Engineer proposed control and construction joint locations for review prior to concrete placement.

REINFORCING STEEL
Reinforcing steel shall conform to ASTM A615, grade 60. Welded Wire Fabric shall conform to ASTM A185. Reinforcing steel to be detailed, fabricated, and placed in accordance with ACI 315 and ACI 318.

Reinforcement and deformed bar anchors to be welded shall be A706 weldable or prior approved equal. Welding of rebar to be approved by Engineer. Welding shall conform to AWS D1.4 standards.

LAP SPLICES
Unless otherwise noted, lap splices shall be minimum 48 x bar diameter.

Clear spacing between bars to be greater than 2 bar diameters. Clear cover greater than 1 bar diameter.

Reinforcement concrete cover requirements, unless otherwise noted in drawings, as follows:

(1) Cast against earth 3"
(2) Cast against form,
Exposed to earth or weather 2"
(3) Walls, slabs, joists
Not exposed to earth or weather 3/4"
(4) Beams, columns
Not exposed to earth or weather 1-1/2"

SOIL & FILL

FOUNDATION/SOILS
Design soil bearing pressure = 4000 psf - See Bulter Associates Geotechnical Report

All foundations shall bear on firm, undisturbed, drained, granular soil free of organic material. If soil is disturbed, compact soil in maximum 8" deep lifts to 95% maximum dry density per ASTM D698.

Contractor to notify Engineer if soil conditions are contrary to the assumed design conditions which may require over excavation and placement of structural fill or a lower assumed soil bearing pressure such as clays, silts or organics.

Exterior footings shall bear a minimum of 2'-8" below finished grade unless otherwise noted in the drawings.

STRUCTURAL FILL
Structural Fill to be GW, GP, SW, or Sp soil under the unified classification system.
Structural Fill shall consist of 4" minus select, clean, granular soil with no more than 12% passing the #200 sieve.
Fill shall be placed in lifts of no more than 8", moisture conditioned, and compacted to 95% of modified proctor density ASTM D1557.
Structural Fill placed below footings must extend laterally outside the perimeter of the footing for a distance equal to the thickness of the fill measured from the bottom of the footing to the underlying undisturbed soil.
Back fill behind stem walls and retaining walls to be the same as prescribed above, except the maximum aggregate size should be 2". Compaction of back fill behind walls shall be done by hand compactors.

DESIGN CRITERIA

BUILDING CODE
Design, construction, and inspection shall conform to the International Building Code, (IBC), 2018 Edition and International Residential Code, 2018 Edition and all Local Codes that may be applicable.

Material test standards referenced shall be the edition referenced in the 2018 IBC.

RISK CATEGORY OF BUILDING: II

DESIGN LOAD CRITERIA
At all times, the General Contractor and Owner shall keep the loads on the structure within the limits of the design load criteria.

The General Contractor is responsible to provide all bracing and shoring as required to support the loads that may be imposed on the structure during construction until all structural elements are complete.

DESIGN ROOF LOADS

Live Load (Snow)	100 PSF (Balanced Snow Load)
Dead Load	20 PSF
Snow Load Duration Factor	1.15
Importance Factor Snow (Is)	1.0

Drift and Un-Balanced Loads per ASCE/SEI 7-16

Ground Snow Load	120 PSF
Exposure Factor (Ce)	1.0
Temperature Factor (Ct)	1.1

DESIGN FLOOR LOADS

Live Load	40 PSF
Dead Load	20 PSF

DESIGN DECK LOADS

Live Load	40 PSF
Dead Load	35 PSF

WIND LOAD DATA

Wind Speed (3 sec. gust)	103 MPH
Importance Factor (Iw)	1.0
Building Category	II
Exposure Category	B
Internal Pressure Coefficient	+/- 0.18

SEISMIC LOAD DATA

Project Coordinates	(43.69, -114.4)
Importance Factor (Is)	1.0
Ss	0.631
S1	0.194
Sds	0.545
Sd1	0.287
Site Class	D
Seismic Design Category	D

Basic Seismic Force Resisting System - Light Frame Walls with Wood Structural Panels
Response Modification Coefficient (R) = 6.5
Equivalent Force Analysis Procedure
F = 1.0
Vbase (unmodified) 0.084*W
Seismic Weights (W) Dead Loads + 35% Balanced Snow Load

STRUCTURAL STEEL

STRUCTURAL STEEL AND MISCELLANEOUS METALS
All structural steel, fabrication, painting, and erection shall comply with AISC Manual of Steel Construction including the Code of Standard Practice and the IBC 2018 edition.

All wide flange sections shall conform to ASTM A992 yield stress = 50 ksi.

All plates, angles, and channels to conform to ASTM A36 yield stress = 36 ksi.

All structural steel tubing to conform to ASTM A500 grade B yield stress = 46 ksi.

All structural steel pipe shall conform to ASTM A501 grade B yield stress = 36 ksi.

Use ASTM A325 bolts where specified in documents for all steel to steel connections with a minimum diameter of 5/8".

Threaded rod to be welded shall conform to ASTM A307 S1 or ASTM F1554 Grade 36. Alternate weldable steel materials may be used with Engineer prior approval.

All bolts shall be tightened to the minimum bolt tension in Accordance with AISC Specifications For Structural Joints Using ASTM A325 or A490 Bolts. Direct tension indicators or twist-off-type tension-control bolt assemblies may be used. Provide carbonized washers between turned element and steel. Connections indicated as slip critical (SC), shall have a minimum of a Class A contact surface preparation and bolts tightened to the specified minimum bolt tension utilizing direct tension indicators.

Holes in structural steel may be made only with Engineer prior approval.

All welding shall be performed in accordance with a Welding Procedure Specification (WPS) as required in AWS D1.1 Structural Welding Code and the IBC 2018 code.

Weld Filler to comply with E70XX low hydrogen electrodes with a Charpy-V-Notch (CVN) of 20 foot-pounds at -20 degrees F. The WPS shall be within the parameters established by the filler metal manufacturer.

Welder shall be certified by AWS standards within the past 12 months. Upon request, written certification shall be submitted to the Architect/Engineer or special inspectors for review.

Welder shall avoid welding directly in the K-area of structural steel.

Shop drawings shall be approved by Engineer prior to fabrication or erection. Shop drawing submittal shall include, but not be limited to, all welding, bolting, dimensions, member size and grade.

CONCRETE MASONRY

Concrete masonry materials and construction shall conform to the American Concrete Institute (ACI) 530.
All concrete masonry units shall conform to ASTM C 90, Grade N-1, and normal weight. Minimum net area compressive strength of masonry units shall be 2,500 PSI at 28 days.
Mortar for all work shall be type M or S.
Grout for filling shall be a minimum compressive strength (f'm) of 2800 psi, and shall conform to ASTM C476, place grout filling 8'-0" maximum lift vertically.
All reinforcing bars for masonry construction shall conform to ASTM A-615 grade 60. Lap length shall be minimum 40 bar diameters.

WOOD FRAMING

SAWN STRUCTURAL LUMBER
Structural lumber shall conform to the latest edition of the West Coast Lumber Inspection Bureau (WCLIB) or Western Wood Products Association (WWPA) grading rules for the specified sizes and minimum grades listed below:

2x & 4x Douglas Fir-Larch No.2
6x and larger Douglas Fir-Larch No.1

Wood Members in contact with concrete or masonry walls below grade or supported by concrete or masonry foundations that are less than 8" from exposed earth shall be naturally durable wood or preservative-treated per AWPA U1. See IRC section 2304.11 for additional decay and termite protection requirements.

LAMINATED VENEER LUMBER (LVL)
Laminated Veneer Lumber shall conform to the minimum allowable design properties listed below. LVL material to be of solid sections. Substitution of multiple piece sections requires Engineer's prior approval.

Where multiple piece LVL sections are specified in drawings, nail two ply and three ply LVL sections with (3) rows 16d common at 12"o.c. each ply.

LVL Minimum Allowable Design Properties:

1-3/4" thick		3-1/2" - 7" thick	
Fb (bending) =	2800psi	Fb (bending) =	3100psi
Fv (horizontal) =	285psi	Fv (horizontal) =	285psi
Fc (parallel) =	3000psi	Fc (parallel) =	3000psi
Fc (perpendicular) =	750psi	Fc (perpendicular) =	750psi
E =	2,000,000psi	E =	2,000,000psi

GLUED-LAMINATED TIMBER
All Glued-Laminated Timber shall conform to the AITC 117 Combination 24F-V8 DF/DF 1.8E unless noted otherwise in drawings. Enclosed or wrapped glued-laminated timbers to be industrial grade finish. Exposed glued-laminated timbers to be architectural grade finish or as indicated in drawings.

Fabrication shall be in accordance with AITC 117. Provide wet use adhesives. Maximum moisture content shall be 15%.

Timbers to be fabricated with single piece lumber across the width or multiple pieces that have been edge bonded.

Install Glued Laminated Timber beams with "TOP SIDE" up as designated on beam.

MANUFACTURED WOOD JOISTS
Manufactured wood "I" Joists, to be manufactured by RedBUILT, Truss Joist Corporation or Boise Cascade, and to be of the type and spacing specified in the drawings.

Joists shall be erected, installed and braced per manufacturer's specifications.

Other manufactured wood joists may be substituted with prior Engineer approval.

All holes must be cut within joist web and meet manufacturer's requirements.

WOOD FRAMING
Conventional Light Framing construction shall conform to IRC section 2308.

All framing fastening shall be in accordance with IRC section 2304.9 unless otherwise noted on the drawings.

Minimum header shall be (3) 2x8 unless otherwise noted in drawings.

Minimum header post shall be 2x6 bearing (trimmer) stud plus 2x6 king stud each end below 6x8 and (2) 2x6 trimmer studs plus 2x6 king stud for 6x10 and larger, unless otherwise noted in drawings.

Typical beam pocket at beam bearing locations shall consist of full beam width 2x6 bearing trimmers and 2x6 grabber stud each side. Where 2x6 grabber studs are not possible, provide Simpson MTS20 or ST6224 steel strap attached equally to beam and bearing stud.

Provide minimum 1-1/4" thick solid blocking below all bearing walls. Provide minimum 1-1/4" thick solid rim board at perimeter of all floors.

Provide solid blocking in floor space below all posts and trimmers from above. Where "I" joists interrupt blocking, provide joist web stiffeners and blocking per manufacturers recommendations.

Typical wall construction to consist of 2x6 studs @ 16"/24"o.c. module with framing members above, U.O.N.
Where wall heights exceed 13'-0", wall construction to consist of 1-1/2"x5-1/2" BCI 2.0E VERSA-STUD at 16"o.c. (or equivalent).

PLYWOOD SHEATHING
All plywood sheathing shall be APA rated exposure 1 plywood with thickness, veneer grades and span ratings as noted herein or in drawings.

Plywood at roof and floors shall be laid with face grain perpendicular to supports and end joints staggered at 4'-0" o.c.. Provide 1/8" space at all panel edges.

Nail roof sheathing with 10d common (0.148"ø x 3") at 6"o.c. boundary edges, 6"o.c. interior panel edges, and 12"o.c. intermediate unless otherwise noted on drawings. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Glue floor sheathing and nail with 10d common (0.148"ø x 3") at 6"o.c. boundary edges, 6"o.c. interior panel edges, 12"o.c. intermediate unless otherwise noted. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Unless otherwise noted in drawings and shear wall schedule, nail APA rated wall panel edges and boundaries with 8d galvanized box (0.131"ø x 2½") at 6"o.c., and 12"o.c. intermediate. Block and edge nail all horizontal panel edges at designated shear walls. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Roof Sheathing:
5/8" CDX minimum (40/20) span rating.

Floor Sheathing:
3/4" CDX T&G minimum (48/24) span rating.

Exterior Wall Sheathing:
15/32" CDX minimum (24/0) span rating unless otherwise noted. 7/16" Oriented Strand Board with the same span rating may be substituted for exterior wall sheathing with panel long dimension applied perpendicular to wall studs.

NAILS, BOLTS, LAGS AND PREFABRICATED CONNECTIONS FOR WOOD
Unless otherwise noted in drawings or hardware supplier specification, all nails shall be common or galvanized box.

Wood bolts and lags shall conform to ASTM A307 grade unless otherwise noted. Provide mild steel plate washers at all bolt heads and nuts bearing against wood.

Metal connectors specified in drawings shall be manufactured by the Simpson Strong Tie Company and installed per their specifications. Other manufacturers may be considered where load capacity and dimensions are equal or better. All substitutions must be submitted to the Engineer for review.

Provide the maximum nailing pattern for all metal connectors.

Nail or screw substitutions, other than manufacturers specified, must have Architect/Engineer prior approval.

Anchoring adhesive shall be two component 100% solids epoxy based system supplied in manufacturer's standard side-by-side cartridge and dispensed through a static mixing nozzle supplied by the manufacturer. Epoxy shall meet the minimum requirements of ASTM C-881 specification for type I,II,IV and V grade 3, class B and C and must develop a minimum 13,390 psi compressive yield strength after 7 day cure.

FOUNDATION NOTES

SEE SPECIFICATION SHEET FOR CONCRETE DESIGN PROPERTIES, MINIMUM REINFORCEMENT SPLICE LENGTHS, ETC.

PLACE ALL FOOTINGS ON UNDISTURBED STRATA OR COMPACTED STRUCTURAL FILL TO THE MINIMUM REQUIRED FROST DEPTH. FOR MORE INFORMATION SEE GEOTECHNICAL REPORT AND SHEET S1.0

FOOTING BEARING CONDITIONS TO BE VERIFIED PRIOR TO THE PLACEMENT OF CONCRETE FORM WORK.

FOOTING REINFORCEMENT TO BE PLACED AT MINIMUM 3" CLEAR FROM BOTTOM OF FOOTING, U.O.N.

LOCATE HOLD DOWNS AT ENDS OF SHEAR WALL ABOVE

ANCHOR BOLTS TO BE ⅝"Ø x10" J BOLTS PLACED 6" FROM ENDS OF WALLS AND @ 48" o.c. BETWEEN U.O.N. PER PLAN AND / OR DETAILS

(32) NUMBER IN SYMBOL DENOTES ANCHOR BOLT SPACING IN INCHES ON CENTER. 48"o.c. MAX.

EXTERIOR WALLS TO BE BACK FILLED WITH COMPACTED FREE DRAINING GRAVEL.

INSTALL RADON ABATEMENT SYSTEM AS MAY BE REQUIRED TO MEET PROVISIONS OF 2018 INTERNATIONAL RESIDENTIAL CODE, APPENDIX F.

FIELD VERIFY ALL FOOTING STEPS AND ELEVATIONS. BOTTOM OF ALL FOOTINGS TO BE A MINIMUM 2'-0" BELOW EXTERIOR FINISH GRADE. SEE GEOTECHNICAL REPORT, GRADING PLAN AND SHEET S1.0 FOR MORE INFORMATION.

FOOTING SCHEDULE

MARK	DEPTH	WIDTH	LENGTH	REINF.
F2.0	1'-0"	2'-0"	2'-0"	(2) #5's E.W.
F4.5	1'-0"	4'-6"	4'-6"	(5) #5's E.W.

1. REINFORCEMENT ASTM A615 GR60
2. PLACE 3" CLEAR BOTTOM FACE

FLOOR AND ROOF FRAMING NOTES

STRUCTURAL FLOOR SYSTEM SHALL BE 3/4" CDX T&G FLOOR SHEATHING GLUE AND NAIL W/ 10d COMMON @ 6"o.c. EDGE, 6"o.c. BOUNDARY, AND 12"o.c. FIELD NAILING OVER I-JOIST PER PLAN, U.O.N.

STRUCTURAL ROOF SYSTEM SHALL BE 5/8" CDX SHEATHING NAIL W/ 10d COMMON @ 6"o.c. EDGE, 6"o.c. BOUNDARY, AND 12"o.c. FIELD NAILING OVER RAFTERS PER PLAN, U.O.N.

FOR TYPICAL BEAM POCKET (NOTED "BP"), AND ALL BEAM BEARING LOCATIONS PROVIDE FULL BEAM WIDTH OF 2x6 TRIMMERS WITH 2x6 KING STUD EACH SIDE. NAIL KING STUD WITH (2) 16d @ 6"o.c. (I/S MINIMUM) TO BEAM AND (1) 16d @ 9" o.c. TO TRIMMER STUD PACK. WHERE KING STUDS NOT POSSIBLE PROVIDE SIMPSON MTS20. OR ST6224 EACH SIDE U.N.O.

PROVIDE SOLID BLOCKING IN JOIST SPACE BELOW ALL POSTS OR TRIMMERS FROM ABOVE. WHERE I-JOISTS INTERFERE WITH SOLID BLOCKING, PROVIDE SQUASH BLOCKING PER JOIST MANUF. INSTRUCTIONS

PROVIDE MST37 STRAP ACROSS ALL BREAK IN TOP PLATES, U.O.N.

WHERE POST STOPS AT A CONTINUOUS HEADER PROVIDE A35 ON EACH SIDE OF POST TO HEADER (10x4)" NAILS TO POST)

NAIL SHEATHING TO ALL MEMBERS LABELED "COLLECTOR" W/ 10d @ 6"o.c. PROVIDE MSTA30 STRAP ACROSS RIDGE AND AT SPLICE LOCATIONS. U.O.N.

WHERE JOISTS FRAME INTO A CONTINUOUS WALL, PROVIDE 1¾ LVL LEDGER TO MATCH JOIST DEPTH, ATTACH LEDGER TO WALL FRAMING W/ (3) SDS25412 SCREWS @ 16"o.c. U.O.N. (USE (2) SDS25412 SCREWS @ 16"o.c. FOR LEDGERS 9" AND LESS), PROVIDE SOLID WOOD BLOCKING WHERE STUD NOT AVAILABLE.

AT ENDS OF ALL HEADERS, PROVIDE MINIMUM 2x6 TRIMMER AND 2x6 KING STUD BELOW 6x8 HEADER AND (2) 2x6 TRIMMERS AND (1) 2x6 KING STUD UNDER 6x10 HEADER OR GREATER, U.O.N. PER PLAN. NAIL KING STUD WITH (2) 16d @ 6"o.c. ((I/S) MINIMUM) TO HEADER AND (1) 16d @ 9" o.c. TO TRIMMER STUD PACK, U.N.O.

#T = NUMBER OF TRIMMER STUDS
#K = NUMBER OF KING STUDS
FA = POST FROM ABOVE, SEE UPPER FRAMING FOR POST SIZE.
AF = ACROSS FLOOR
BP = BEAM POCKET
ATR = ALL THREADED ROD ASTM F1554 GRADE 36 OR A307

WHERE STUD HEIGHT EXCEEDS 13'-0" USE LSL OR LVL STUDS PER STRUCTURAL SPECIFICATIONS ON SHEET S1.0.

PARALLEL STRAND LUMBER (PSL) MAY BE SUBSTITUTED FOR LVL MATERIAL WITH THE SAME DIMENSIONS AS NOTED ON PLAN AND WITH DESIGN PROPERTIES PER S1.0.

PROVIDE SOLID BLOCKING W/ IN WALL FRAMING FOR HANDRAIL / GAURDRAIL / GRAB BARS ETC. ATTACHMENT WHERE OCCUR.

ISSUE DATE
CUP SET: MARCH 31, 2023

PRATT RESIDENCE
406 SAGE ROAD KETCHUM, ID

PROFESSIONAL ENGINEER
LICENSED
03/31/23
14254
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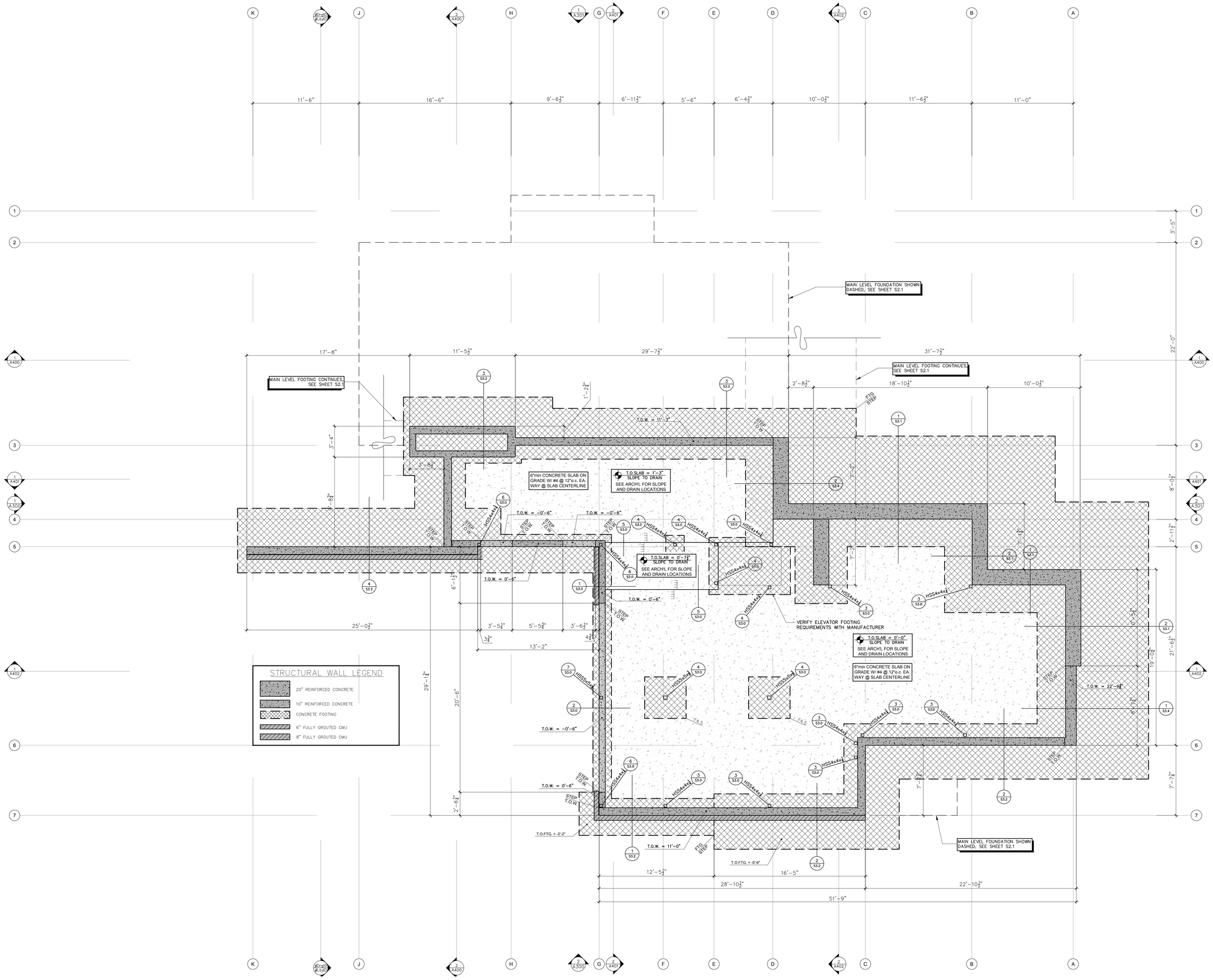
S1.0



FOUNDATION PLAN

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

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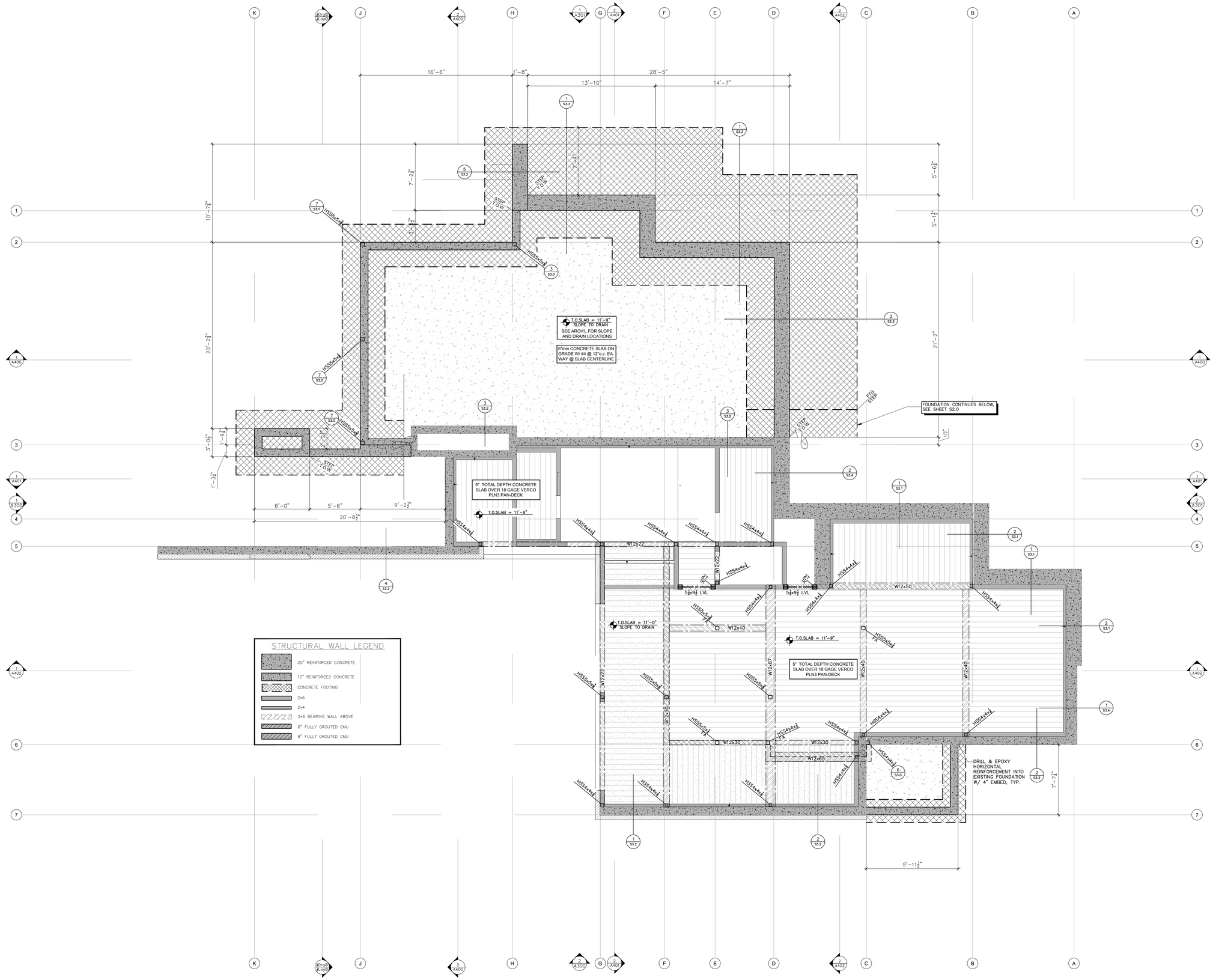

SECOND LEVEL FLOOR FRAMING PLAN

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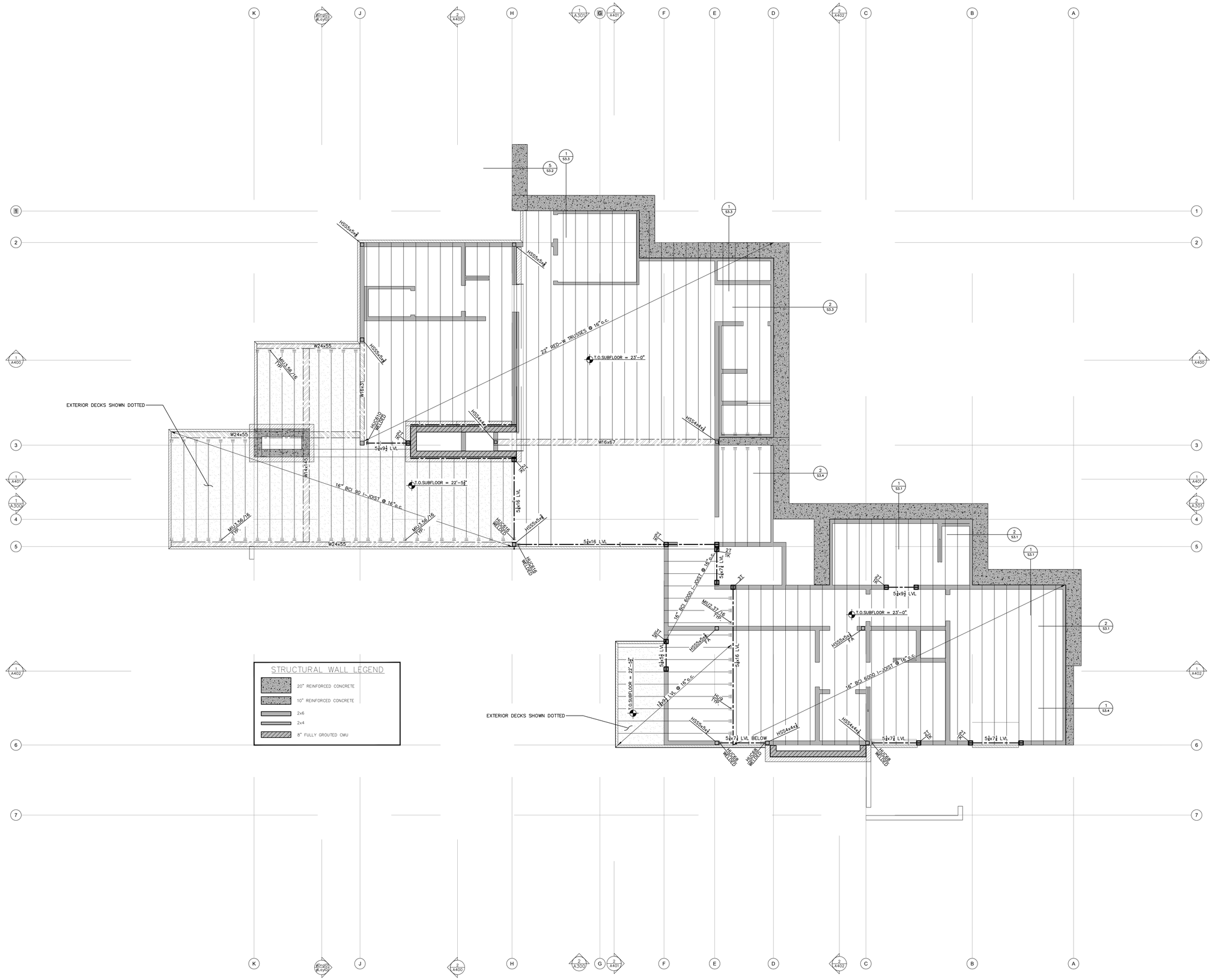

THIRD LEVEL FLOOR FRAMING PLAN

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

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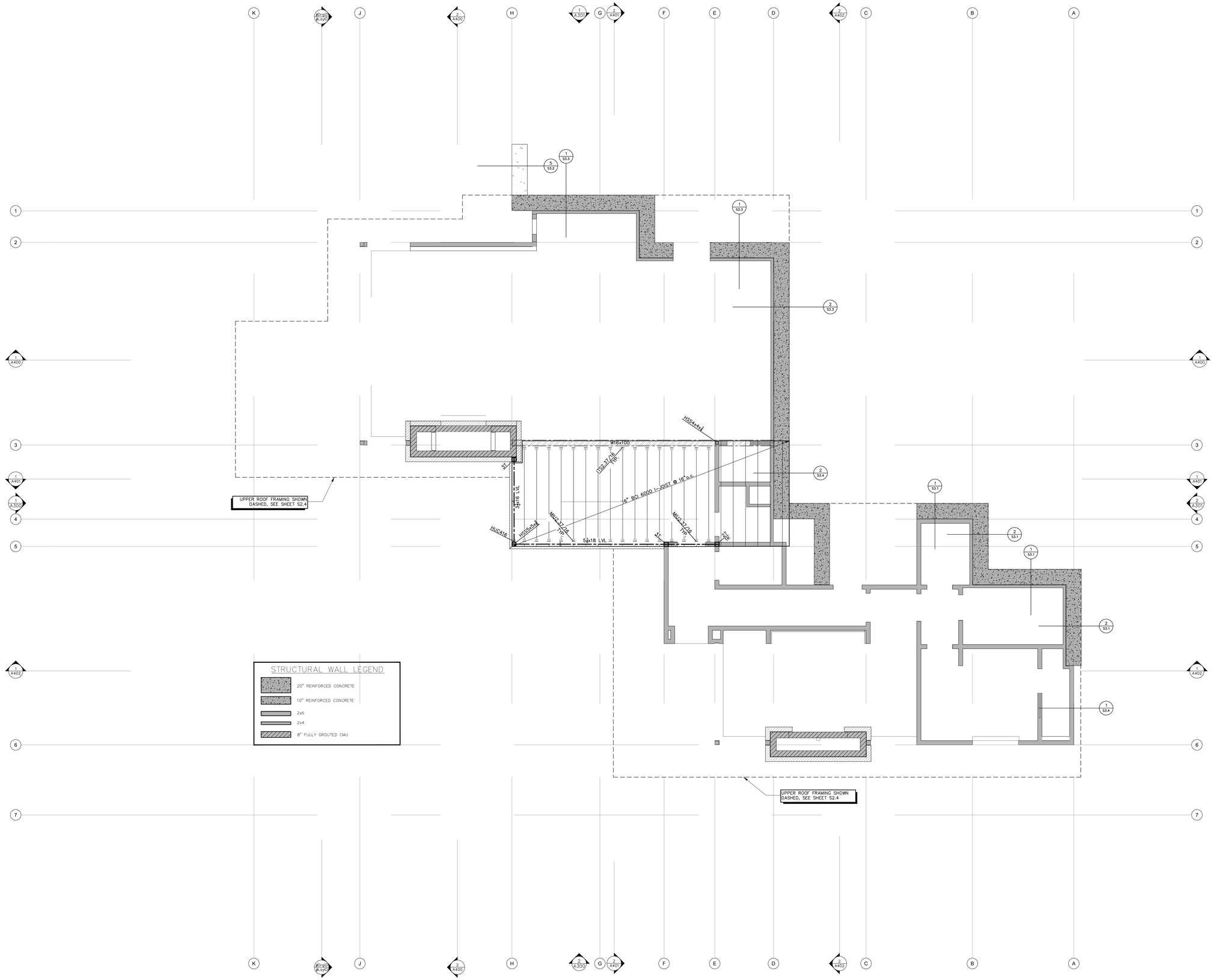

LOWER ROOF FRAMING PLAN

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

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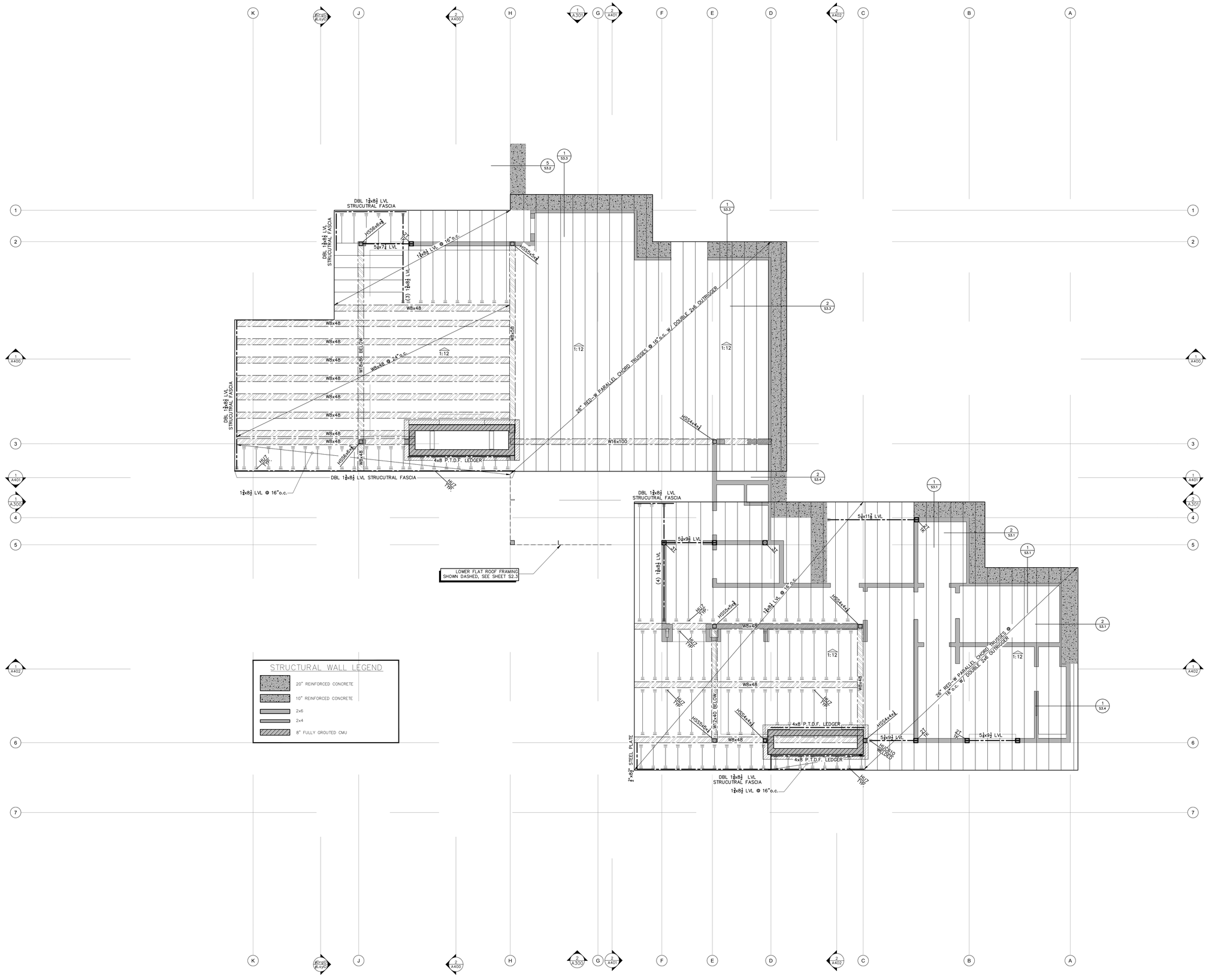

UPPER ROOF FRAMING PLAN

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

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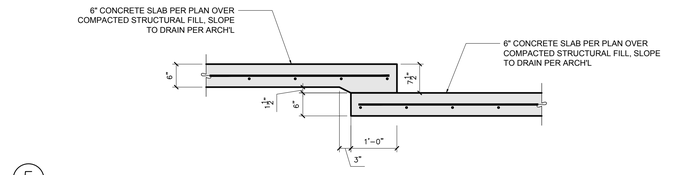
S2.4



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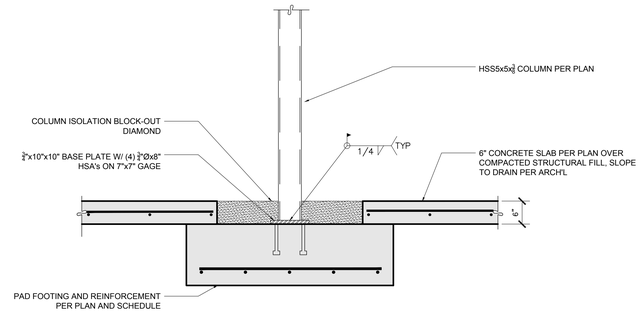

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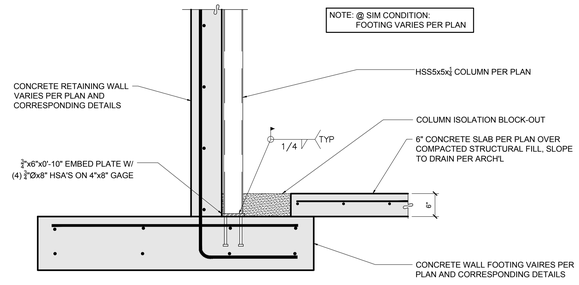

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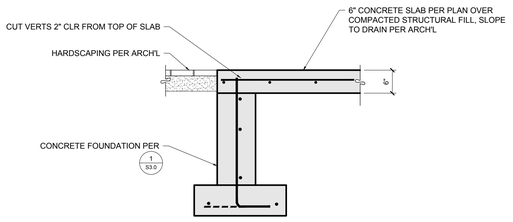

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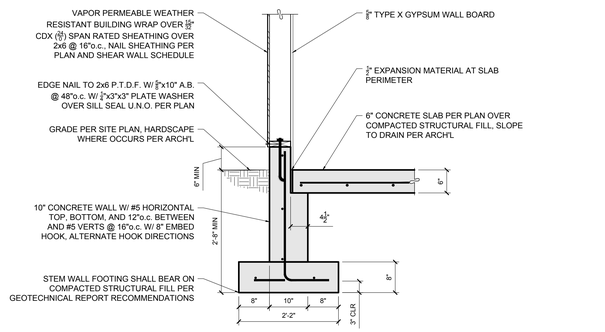

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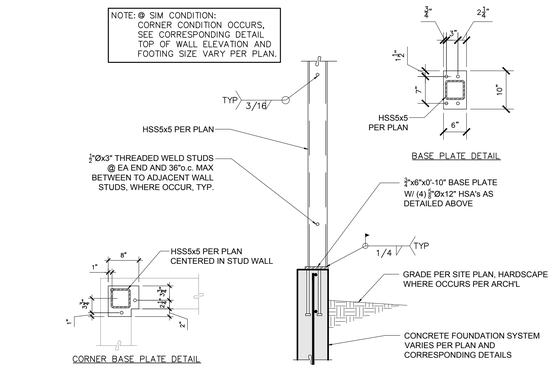
SCALE: 3/4" = 1'-0" U.N.O.



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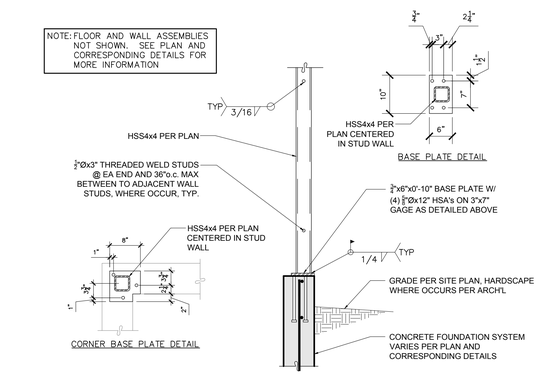

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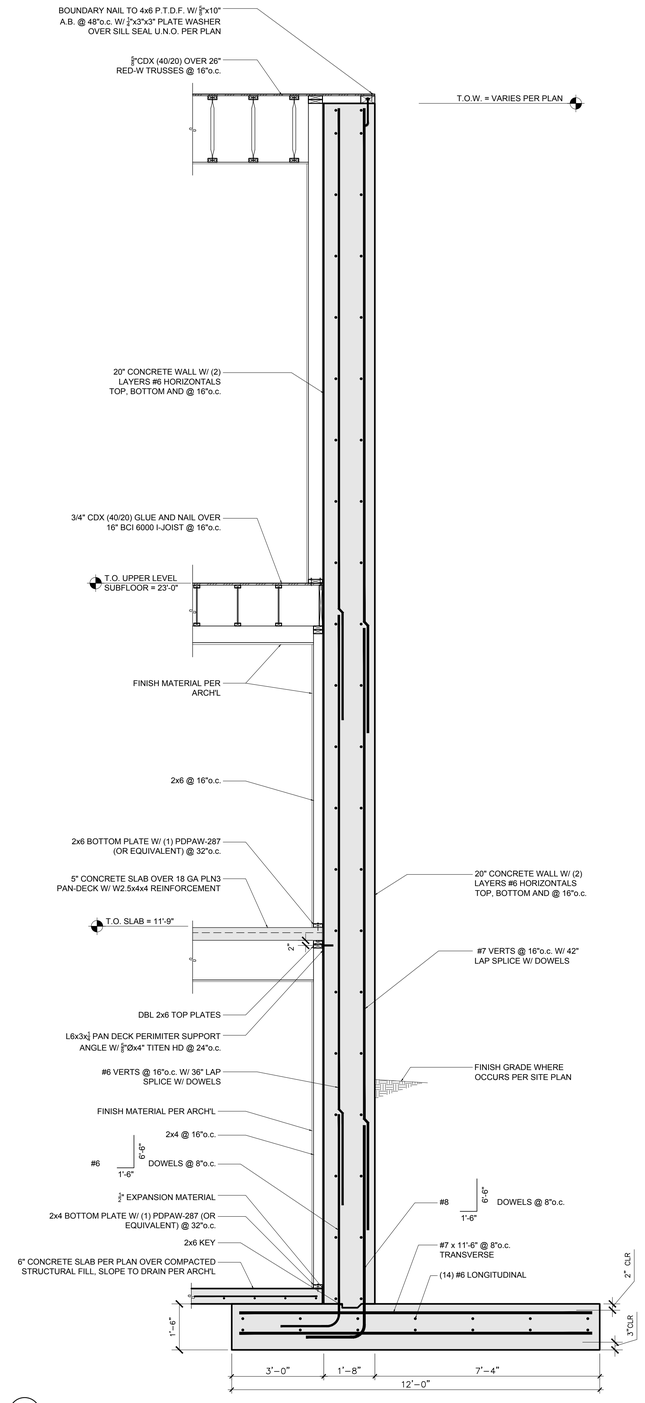
S3.0



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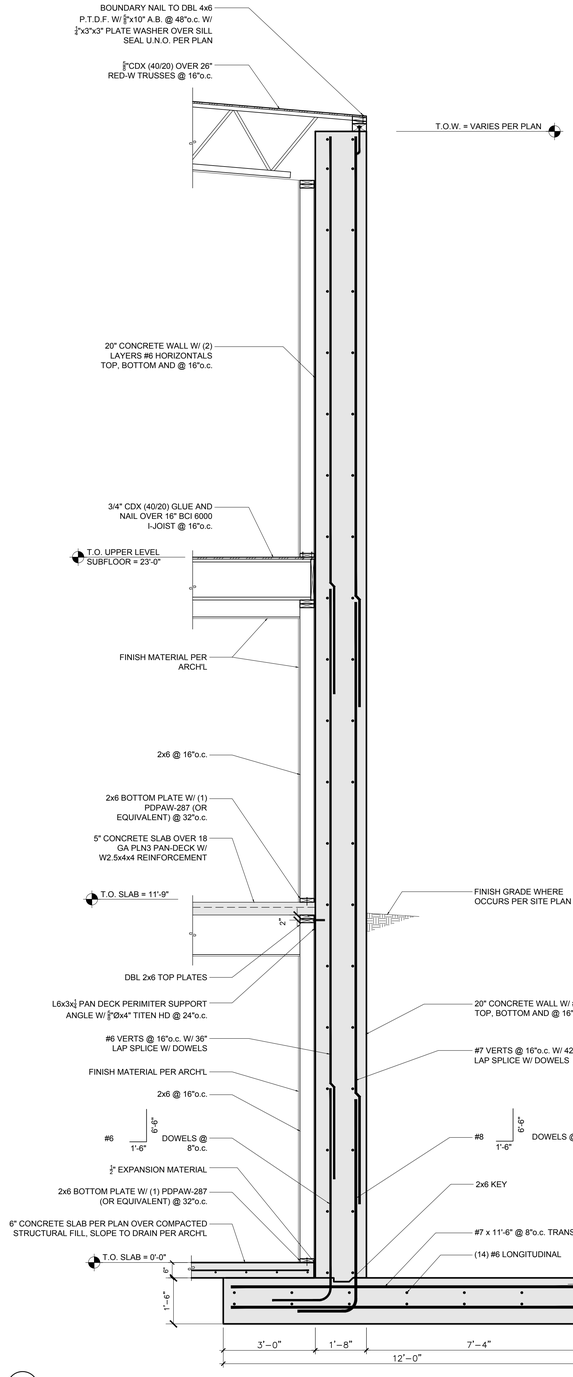

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SCALE: 1/2" = 1'-0" U.N.O.

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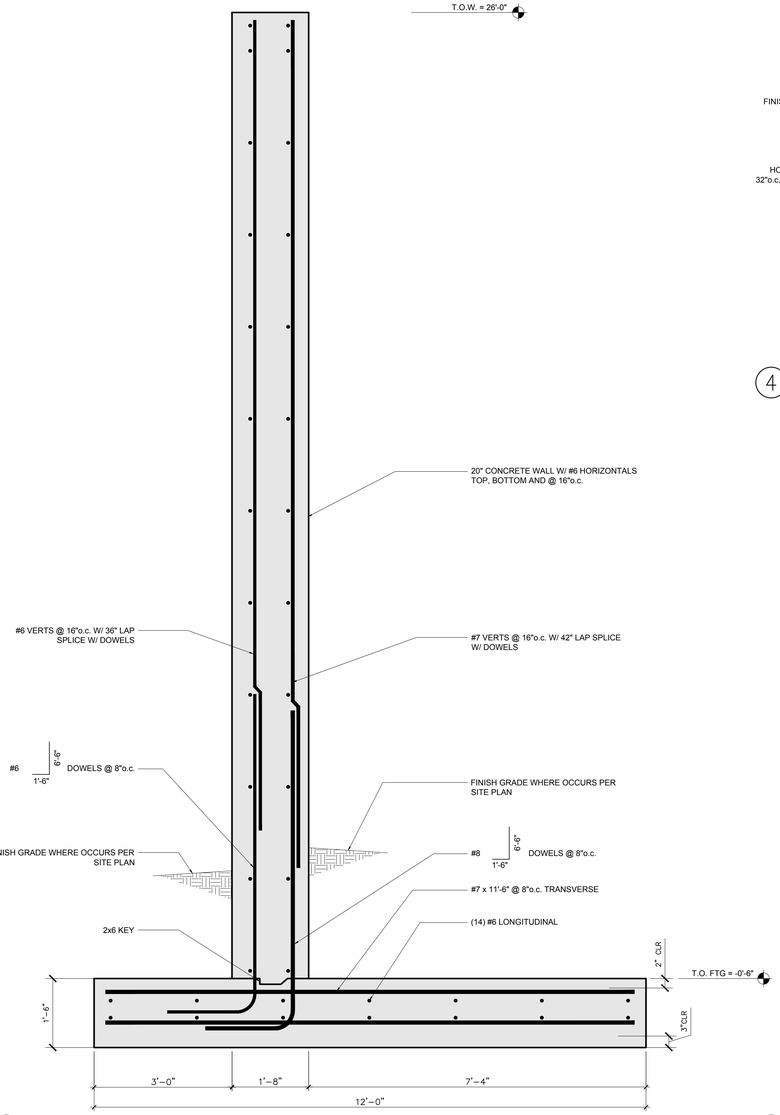
S3.1



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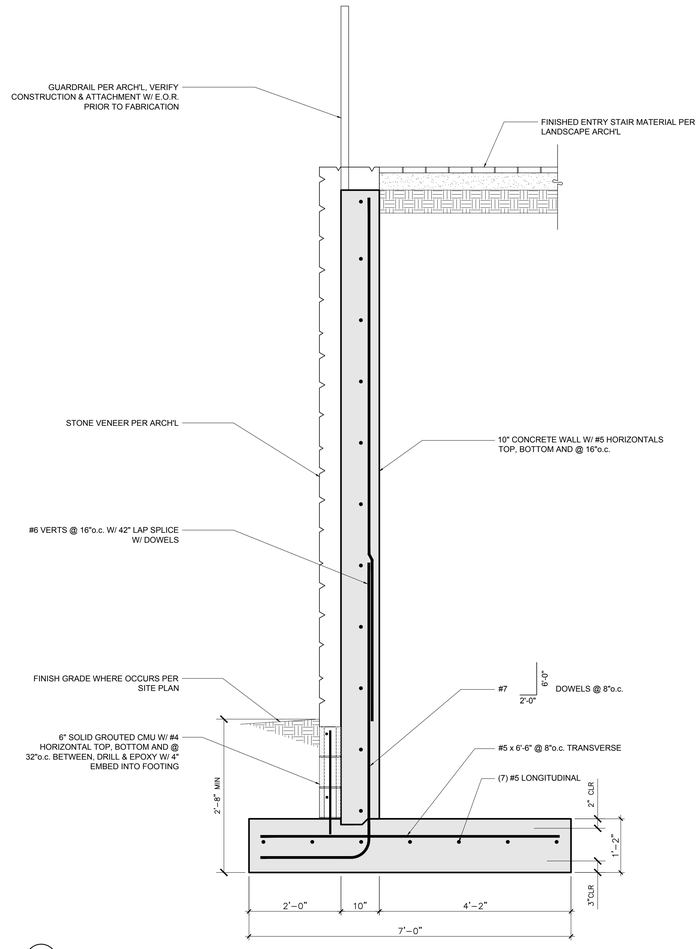

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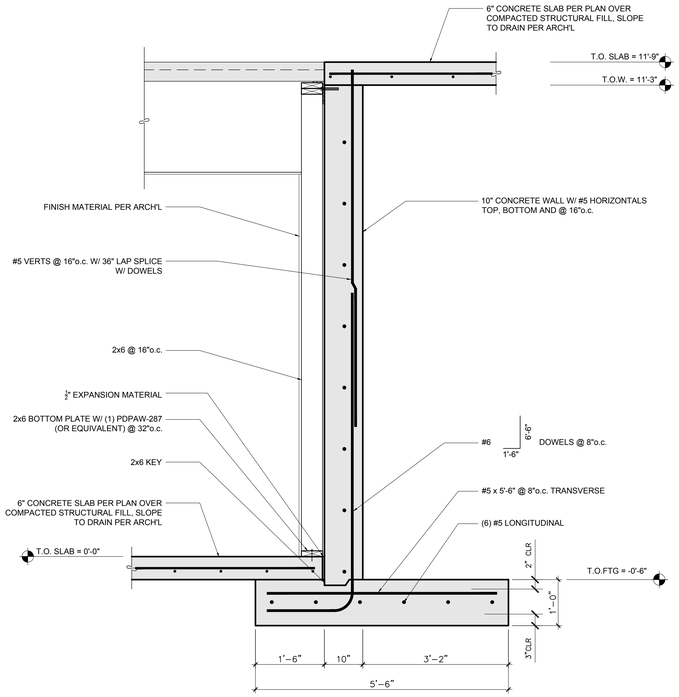

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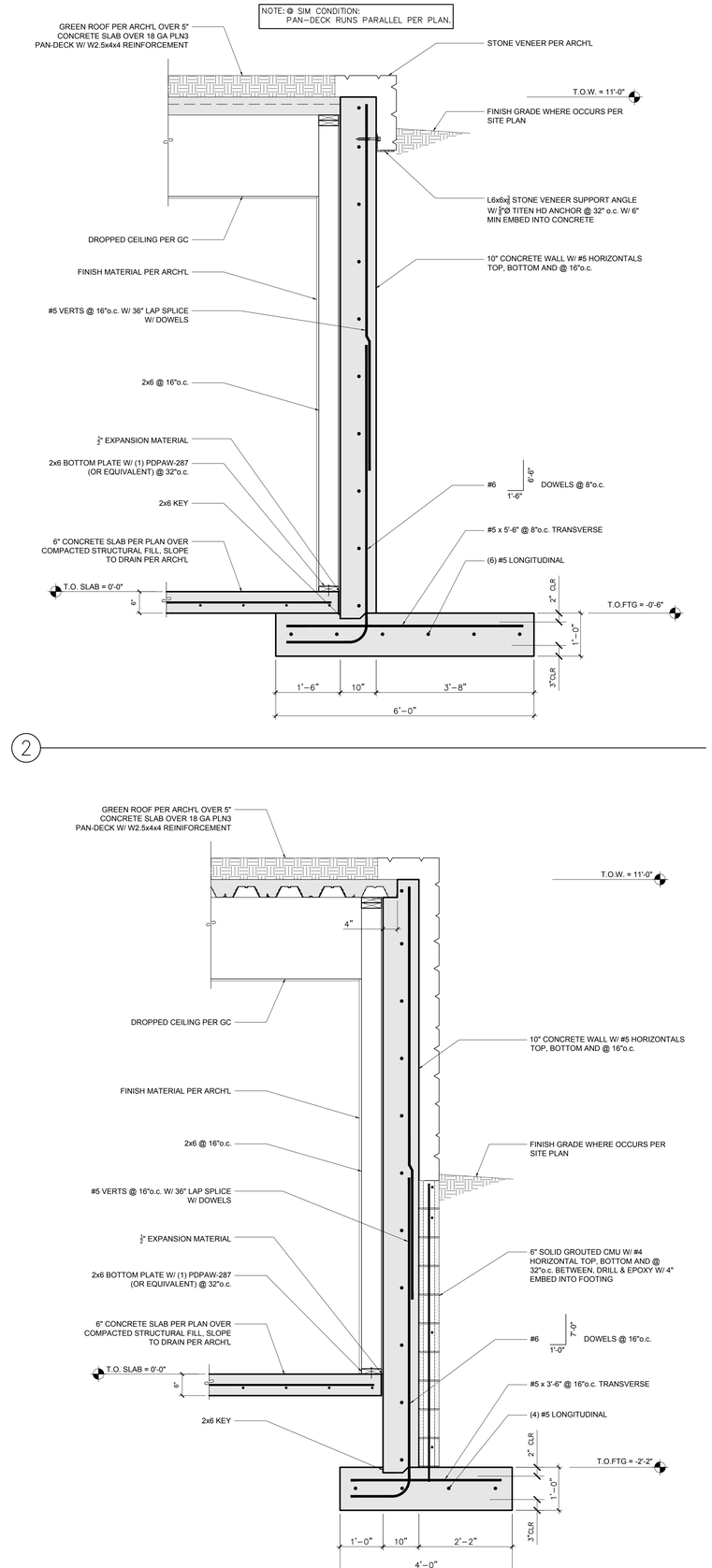

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SCALE: 3/4" = 1'-0" U.N.O.

ISSUE DATE

CUP SET: MARCH 31, 2023

PRATT RESIDENCE

406 SAGE ROAD KETCHUM, ID

PROFESSIONAL ENGINEER LICENSED 03/31/23 14254 STATE OF IDAHO CRAIG MAXWELL

MAXWELL STRUCTURAL DESIGN STUDIO
CRAIG MAXWELL P.E.
105 Lewis Street, Unit 205 :: Ketchum, Idaho 83340
P.O. Box 1911 :: Sun Valley, Idaho 83353
Cell: 208.721.2171 :: Office: 208.721.2171
www.maxwellsds.com

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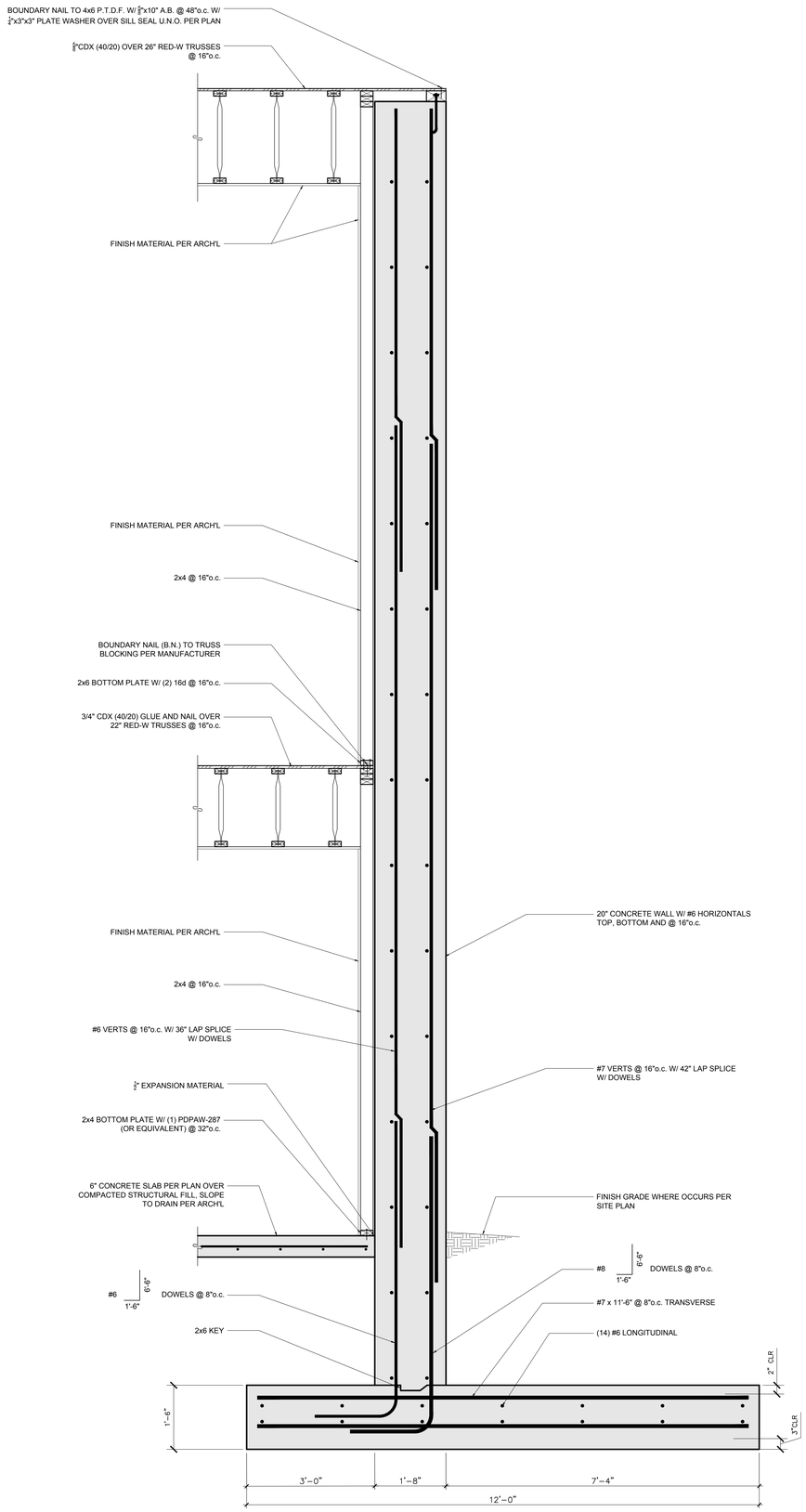

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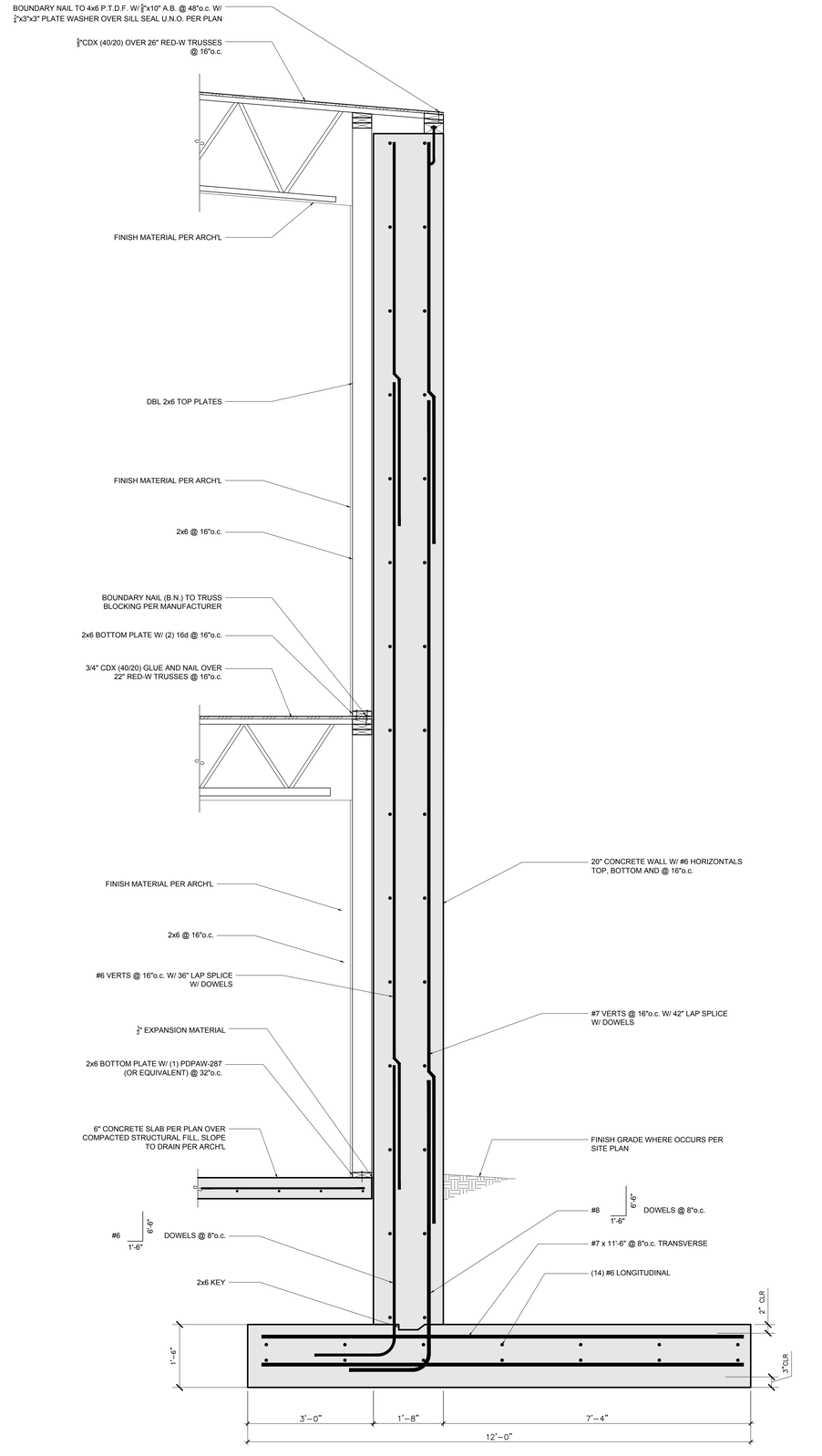

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SCALE: 3/4" = 1'-0" U.N.O.

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406 SAGE ROAD

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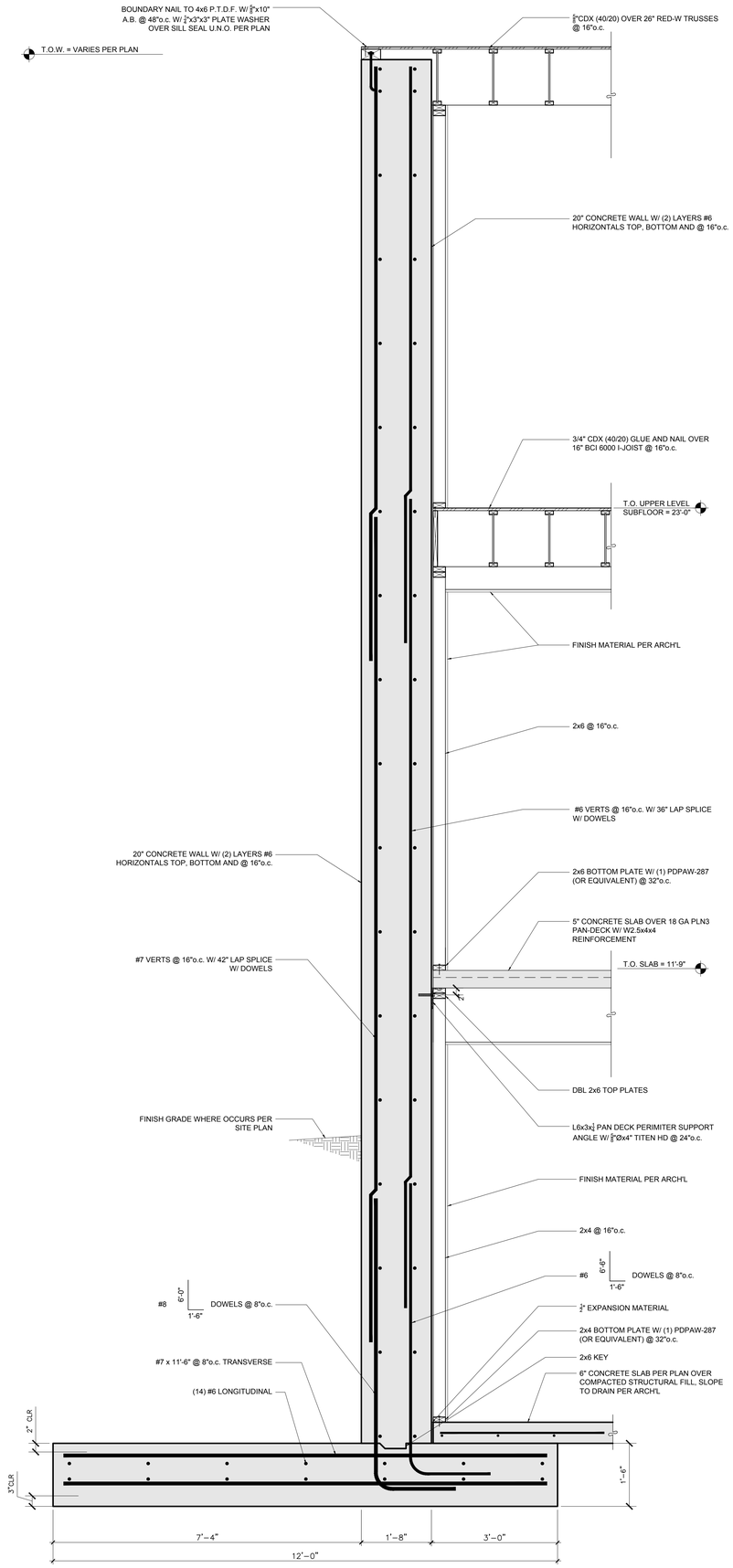

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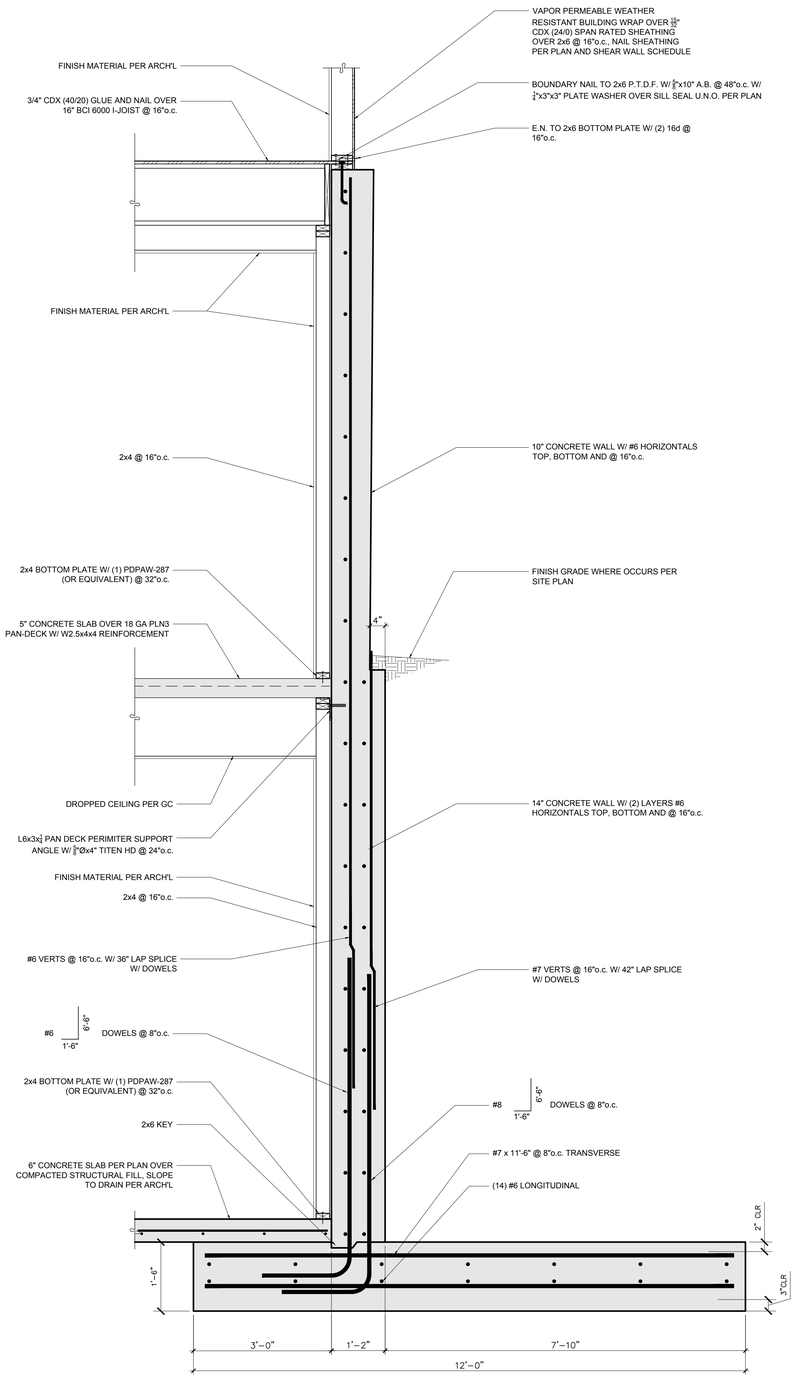

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SCALE: 3/4" = 1'-0" U.N.O.

ISSUE DATE

CUP SET: MARCH 31, 2023

PRATT RESIDENCE

406 SAGE ROAD KETCHUM, ID

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P.O. Box 1911 = Sun Valley, Idaho 83353
Cell: 208.721.2171 = craig@maxwellsds.com = 208.721.2171
www.maxwellsds.com

S3.4

City of Ketchum

Attachment C:

Conditional Use Permit – Application Materials and Supplemental Documents

City of Ketchum
Planning & Building

OFFICIAL USE ONLY
File Number:
Date Received:
By:
Fee Paid:
Approved Date:
Denied Date:
By:

Conditional Use Permit Application

Submit completed application and payment to the Planning and Building Department, PO Box 2315, Ketchum, ID 83340 or hand deliver to Ketchum City Hall, 191 5th St. West, Ketchum. If you have questions, please contact the Planning and Building Department at (208) 726-7801. To view the Development Standards, visit the City website at: www.ketchumidaho.org and click on Municipal Code.

OWNER INFORMATION	
Project Name: Pratt Residence	
Name of Owner of Record: Bradley & Gail Pratt	
Physical Address: 406 Sage Road	
Property Legal Description: Warm Springs Village Subdivision, 4th Addition, Block 3, Lot 23	
Property Zoning District: General Residential Low-Density (GR-L)	
Contact Phone: (208) 727-1988	Contact Email: bsmith@alpineenterprisesinc.com

PROJECT INFORMATION	
Description of Proposed Conditional Use:	To allow for a new avalanche resistant single-family residential structure within the Avalanche Overlay District.
Description of Proposed and Existing Exterior Lighting:	See Architectural Plans. No exterior lighting is associated with the avalanche mitigation structure.

ADDITIONAL COMMENTS

See the attached Narrative & Engineering Statements.

ACCOMPANYING SUPPORTING INFORMATION REQUIRED

• Existing Site Plan • Proposed Site Plan • Landscape Plan • Grading and Drainage Plan • Exterior Lighting Plan and Specifications • Other plans and studies related to the social, economic, fiscal, environmental, traffic, and other effects of the proposed conditional use, as required by the Administrator

Applicant agrees to observe all City ordinances, laws and conditions imposed. Applicant agrees to defend, hold harmless and indemnify the City of Ketchum, city officials, agents and employees from and for any and all losses, claims, actions, judgments for damages, or injury to persons or property, and losses and expenses caused or incurred by Applicant, its servants, agents, employees, guests and business invitees and not caused by or arising out of the tortuous conduct of city or its officials, agents or employees. Applicant certifies that s/he has read and examined this application and that all information contained herein is true and correct.

Bruce S.

Representative's Signature

Bruce Smith, PLS 7048
Alpine Enterprises Inc.

31JAN23

Date

*Once your application has been received, we will review it and contact you with next steps. No further action is required at this time.

ALPINE ENTERPRISES INC.

Surveying, Mapping, Civil Engineering, GPS, GIS, and Natural Hazards Consulting

Bruce Smith, PLS
Alex Nelson, PE
Alpine Enterprises Inc.
P.O. Box 2037
Ketchum, ID 83340
(208) 727-1988
alexnelson@alpineenterprisesinc.com

January 20th, 2023

City of Ketchum
Planning & Building Department

RE: 406 Sage Road – Conditional Use Permit Application
Warm Springs Village Subdivision, 4th Addition, Block 3, Lot 23
Ketchum, ID 83340

Please find the attached Conditional Use Permit Application and plans for the proposed Pratt Residence located at 406 Sage Rd. in Ketchum, Idaho.

The owners wish to redevelop the existing parcel, Warm Springs Village Subdivision, 4th Addition, Block 3, Lot 23, into a new single-family residential dwelling. The Subject Property is located within the City of Ketchum's Avalanche Zoning District. As a result, any new development within this Zone must be designed to withstand the potential avalanche forces, to not deflect avalanche runout towards the property of others, and to not increase the danger to persons or property. The current residential structure was constructed in 1966, before avalanche design requirements were implemented, and consequently is not safe from avalanche danger.

We have worked with the Owners, the Designers at Farmer Payne Architects, and Structural Engineer at Maxwell SDS to make this an avalanche aware design from the inception. Numerous meetings with the Owners, Farmer Payne Architects, and Maxwell SDS have resulted in what we believe to be the best location, orientation, and design for the proposed residence. The goal was to keep the structure and its surrounding property as safe as possible while still maintaining the Owners vision for their property. An important aspect of the design was to be deflection neutral. The design also adds an element of safety to the existing down path residences. The proposed structure was oriented in a manner that will entrap the potential avalanche runout in order to not deflect avalanche runout towards the property of others. Any snow momentarily deflected by the structure will be immediately entrained by the rest of the slide as it passes by ensuring there will not be increased risks to neighboring properties. The structure was also located immediately adjacent to the minimum front yard setback in an attempt to reduce the potential avalanche forces associated with Red Hazard Zones. It should be remembered that persons and property inside an avalanche resistant structure will be safe from avalanche danger, but persons or property on the outside of a proposed structure could be at risk.

According to the structural plans by Maxwell SDS the height of the proposed avalanche protection wall would range between 22' and 26' above finish grade along the Westerly side of the building. The avalanche protection wall is an extension of the buildings foundation and was a component in the aesthetic design choices.

Conditional Use Permit Criteria:

A. *The characteristics of the conditional use will not be unreasonably incompatible with the types of uses permitted in the applicable zoning district.*
   - The surrounding neighborhood and adjacent properties have all been developed with similar avalanche protection structures. The neighboring properties that do not have similar avalanche mitigation structures were developed before it was a requirement.

B. *The conditional use will not materially endanger the health, safety, and welfare of the community.*
   - The proposed structure will not endanger the health, safety, and welfare of the community as far as any development within an Avalanche Hazard zone can be considered, but as long as the City allows development within Avalanche Hazard Zones, we feel that the owner has a vested right to responsibly develop this property. The existing structure on the subject property as well as numerous neighboring properties were developed before avalanche protection was a requirement. These structures have endangered the health, safety, and welfares of the community and have also created

the need for stricter codes and enforcement. The proposed development would replace an existing nonconforming structure, act as a mitigation structure for downslope properties, and would decrease the risks to the community.

C. The conditional use is such that pedestrian and vehicular traffic associated with the use will not be hazardous or conflict with existing and anticipated traffic in the neighborhood.

- The proposed development is within a platted subdivision that was recorded in 1961. The subject property was identified as being within an Avalanche Zone by the City of Ketchum in 1979. The vehicular and pedestrian traffic associated with this property would be consistent with every other lot and development within the subdivision.

D. The conditional use will be supported by adequate public facilities or services and will not adversely affect public services to the surrounding area, or conditions can be established to mitigate adverse impacts.

- The proposed development is within a platted subdivision that was recorded in 1961 and the property is currently serviced by City water and sewer.

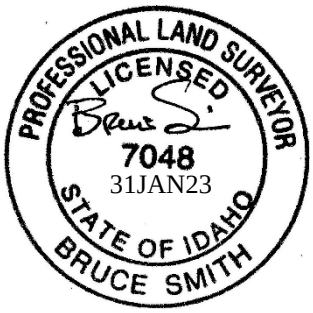
E. The conditional use is not in conflict with the policies of the comprehensive plan or the basic purposes of this chapter.

- The proposed development does not conflict with the policies of the City's Comprehensive Plan or the basic purpose of the Conditional Use requirements.

Should you need further information, please do not hesitate to contact me.

Sincerely,

Bruce Smith, PLS 7048, Idaho
Alex Nelson, PE 19275, Idaho



MAXWELL
STRUCTURAL DESIGN STUDIO

AVALANCHE ZONE MEMORANDUM February 13, 2023

TO: City of Ketchum – Planning and Zoning Department
480 East Avenue North
Ketchum, Idaho 83340
208-726-7802

FROM: Craig Maxwell P.E.

RE: Pratt Residence
406 Sage Road
Ketchum, Idaho

To whom it may concern,

This memorandum is to accompany the Conditional Use Permit and Design Review Application for the single-family residence that is to be built within Ketchum's Avalanche Overlay District at 406 Sage Road in Ketchum, Idaho. This memorandum certifies that the proposed construction as designed will withstand the avalanche forces as set forth in the 2023 Snow Avalanche Hazard Evaluation Block 3, Lot 23, Warm Springs Village Subdivision, 4th Add. located within Section 11 & 14, T. 4N., R.17E., B.M., City of Ketchum, Blaine County, Idaho by Alpine Enterprises Inc.

If there are any further questions, please contact me.

Sincerely,

Craig Maxwell

CRAIG@MAXWELLSDS.COM • 208 721 2171 • PO BOX 1911 • SUN VALLEY, IDAHO 83353

ALPINE ENTERPRISES INC.

Surveying, Mapping, Civil Engineering, GPS, GIS, and Natural Hazards Consulting

Alex Nelson, PE
Alpine Enterprises Inc.
P.O. Box 2037
Ketchum, ID 83340
(208) 727-1988
alexnelson@alpineenterprisesinc.com

May 17th, 2023

City of Ketchum
Planning & Building Department

RE: 406 Sage Road – Retaining Wall Engineering Statement
Warm Springs Village Subdivision, 4th Addition, Block 3, Lot 23
Ketchum, ID 83340

I have reviewed the Grading and Landscape Plans, dated May 17th 2023, for the proposed Pratt Residence located at 406 Sage Rd. in Ketchum, Idaho to determine if the planned boulder slope retainage would qualify as permanent structures or require engineering in pursuant to Ketchum Municipal Code 17.12.030. It is of my professional opinion that the proposed retainage is not structural or permanent under the current definitions and should be evaluated as landscape features.

Should you need further information, please do not hesitate to contact me.

Sincerely,

Alex Nelson, PE 19275, Idaho

City of Ketchum

Attachment D:

Conditional Use Permit – Plan Set

SNOW AVALANCHE HAZARD EVALUATION
WARM SPRINGS VILLAGE SUBDIVISION, 4TH ADDITION
BLOCK 3, LOT 23
406 SAGE ROAD
LOCATED WITHIN SECTIONS 11 & 14, T. 4 N., R.17 E., B.M.,
CITY OF KETCHUM, BLAINE COUNTY, IDAHO

Prepared for
Bradley & Gail Pratt

Bruce Smith, PLS 7048
Alex Nelson, PE 19275
Alpine Enterprises Inc.
P.O. Box 2037
Ketchum, Idaho 83340

This report will attempt to delineate the potential avalanche danger at the study site by correlating key data, both quantitatively and intuitively, to show runout distances and destructive power within the limits of the avalanche hazard forecasting art. The avalanche hazard areas in this study are considered by Alpine Enterprises, Inc., the City of Ketchum, the owners and their planners to be reasonable for regulatory purposes. However, neither Alpine Enterprises, Inc., the City of Ketchum, nor the owners or their planners represents, warrants or implies that areas outside of the designated avalanche zones are safe and free from avalanches or avalanche danger. The effects of natural and artificial hazards other than snow are not discussed in this report.

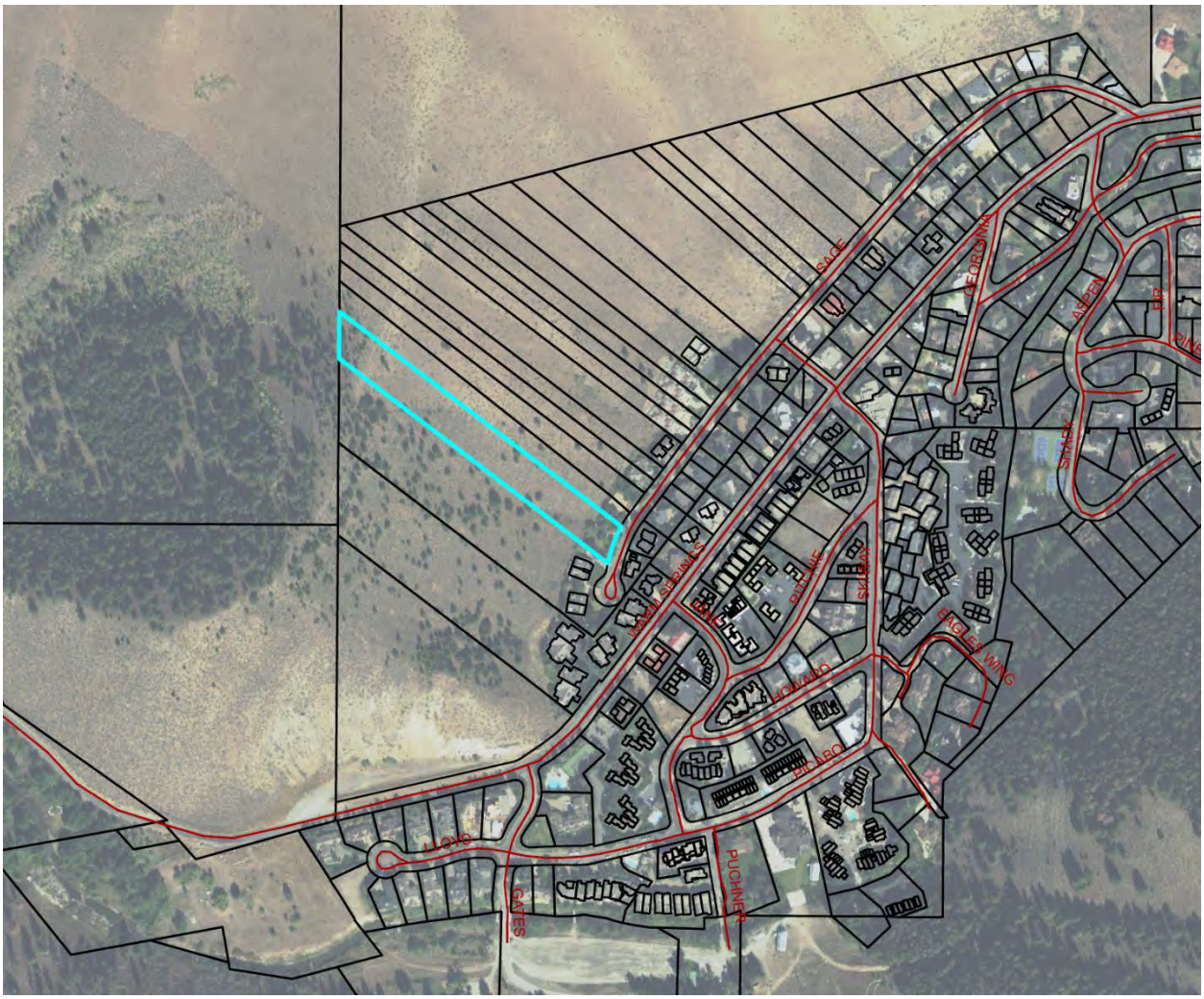


Figure 1 - Vicinity Map (Image Not to Scale)

The purpose of this study is to discuss the potential Snow Avalanche Hazard for the proposed residence at Warm Springs Village Subdivision 4th Addition, Block 3, Lot 23, located at 406 Sage Road, City of Ketchum, Idaho. This discussion applies only to these Lots and should not be used for other areas. The subject property is located within portions of Sections 11and 14, Township 4 North, Range 17 East, Boise Meridian, Blaine County, Idaho. The geographic position is roughly 43°41'11.7" North Latitude, and 114°24'15.6" West Longitude. Elevations range from approximately 5920 feet on the valley floor, to about 6410 feet on top of a ridge that may affect the general area. Downtown Ketchum, Idaho, lies approximately 2.5 miles Southeasterly of the study site. Topographic maps used in the calculations come from a Site Plan produced by Alpine Enterprises Inc. using site specific data, Blaine County GIS LiDAR, and Parcel Data.

Field inspections and avalanche observations of the general area have taken place from circa 1980 through 2022, and field inspections of the site took place in May of 2022.

AVALANCHE CHARACTERISTICS

The following discussion is to help the reader better understand conditions that may lead to an avalanche event. The difference between grade in percent and inclination in degrees should be noted. Percent grade is calculated by the vertical rise divided by the horizontal distance. Inclination in degrees is calculated by taking the arctangent of the grade in percent. A four to one slope = 25% = 14°. Avalanches are generally divided into three areas: a starting zone, a track, and a runout zone. In general, an open slope with an inclination over 27° that receives large amounts of snow can be considered a potential starting zone. Once the snow is set in motion, a slope angle of 17° is all that is required to keep the snow moving through the track, although 22° to 35° is a more typical track angle. The runout zone is where the slide starts losing momentum and the debris finally comes to rest. Runouts may begin when the slope angle flattens to 10° and some will continue across flats and even uphill.

Avalanches may be put into two general types: loose snow, and slabs. These two may be further subdivided into wet and dry. Loose snow slides occur when individual snow grains, due to a lack of cohesiveness, reach their angle of repose and slide down the hill in a generally harmless repositioning, known as a sluff. Wet snow sluffs, although slow moving, may present a hazard due to the sheer mass involved. This type of slide usually occurs in the springtime when factors such as high temperatures, warm winds, rain, and solar radiation create a melt-water saturated snowpack which slides on the ground. Slushflows have been documented on slopes as shallow as 3°, but these are rare occurrences and can generally be disregarded for land planning purposes. On slopes steeper than 50°, loose snow sluffs occur almost continually during storms, thus preventing accumulations that could become hazardous.

Slab avalanches occur involving entire layers in the snowpack and have the potential to become extremely dangerous. The most common type of slab avalanche occurs when large amounts of wind deposited snow accumulate on a slope into a cohesive slab, sitting on top of a weaker layer. With an appropriate trigger, this slab layer will fracture into blocks of snow and begin moving rapidly down the hill, picking up momentum and entraining more snow as it propagates. The slide moves on a bed surface, which may be a deeper layer of snow or the ground. Structural instability in the snowpack occurs due to many factors, some of which are: heavy amounts of snowfall, extreme air temperature changes, a temperature gradient through the layers that forms weak crystals, rainfall, or an ice crust layer.

AVALANCHE ZONING

The City of Ketchum uses roughly the same zoning plan that was developed in Switzerland over 60 years ago. The main difference in the two systems is the "return period" factor. Avalanches have been documented for centuries in Europe, while Blaine County still lacks actual records of occurrences. The best available evidence is talking to long time area residents, old newspaper

articles, and terrain analysis with personal observations and records.

This report will use the three color (or three zone) system. The three zones are defined as follows:

RED (High Hazard) Zone. This area includes terrain where avalanches are expected to have (a) an impact pressure of 30 kPa (600 Lb/Ft^2) or greater with a return period up to 300 years, and/or (b) a return period of 30 years or less regardless of impact pressure. Buildings, roads, and winter parking are generally not allowed in the Red Zone (except in the Cities of Ketchum and Sun Valley).

BLUE (Low Hazard) Zone. This area is the transition zone between high hazard and no hazard zones. Avalanches are expected with impact pressures of less than 30 kPa (600 Lb/Ft^2) and return periods between 30 and 300 years.

WHITE (No Hazard) Zone. This area includes terrain with very infrequent small slides and the potential for less than 3 kPa (60 Lb/Ft^2) from the air blast of a Very Large Avalanche.

The avalanche path modeled in this study that could affect the site and the proposed structure lies within the Red and Blue Hazard Zones, and its size classification is Small.

Please refer to Ketchum Municipal Code, Chapter 17.92 Avalanche Zone District (A) for further Conditions and Restrictions, as it is subject to change.

It is generally regarded that it is not economically feasible to build wood frame structures capable of withstanding pressures greater than 10 kPa (200 Lb/Ft^2), so reinforced concrete structures may be the most logical direct protection alternative. In some cases, avalanche mitigation structures such as catching dams or deflecting berms may be more suitable. Any structure that encourages gatherings of people such as schools, churches, and hotels, should not be allowed.

HISTORY

The Sun Valley and Blaine County areas have seen man's activities since the late 1800's, but a detailed history of avalanche activity has not been kept. Personal observations, videos, photos, old newspaper articles and interviews with long time area residents recall that avalanches have occurred regularly in the Warm Springs area. In my brief 40 years living in Ketchum, I have observed numerous avalanches in this area, but none, so far, at the subject property.

A former Blaine County Planning and Zoning Administrator recalled stories of a storm in the early 1930's when "it snowed 2 feet, and then rained hard on the new snow, and nearly everything slid." A similar report from the early 1900's reports the same conditions.

The circa 1978, Avalanche Study, conducted by Arthur I. Mears, that was used as the basis for Ketchum's Avalanche Overlay District shows the subject property to be in a Red Zone. Whereas the circa 1977 Avalanche Study, conducted by Norman A. Wilson, shows the subject property outside of avalanche hazard areas. These maps were produced before most of the development occurred in the area and were before Avalanche Dynamics Software and LiDAR mapping were available.

Figure 2 - This photo shows a January 2004 event at the intersection of Sage Road and Skiway Drive and is similar to what could be expected at the site.

Figure 3 - This photo shows a January 2008 event on Sage Road and is similar to what could be expected at the site.

Figure 4 - This photo shows a January 2004 event on Sage Road and is similar to what could be expected at the site.

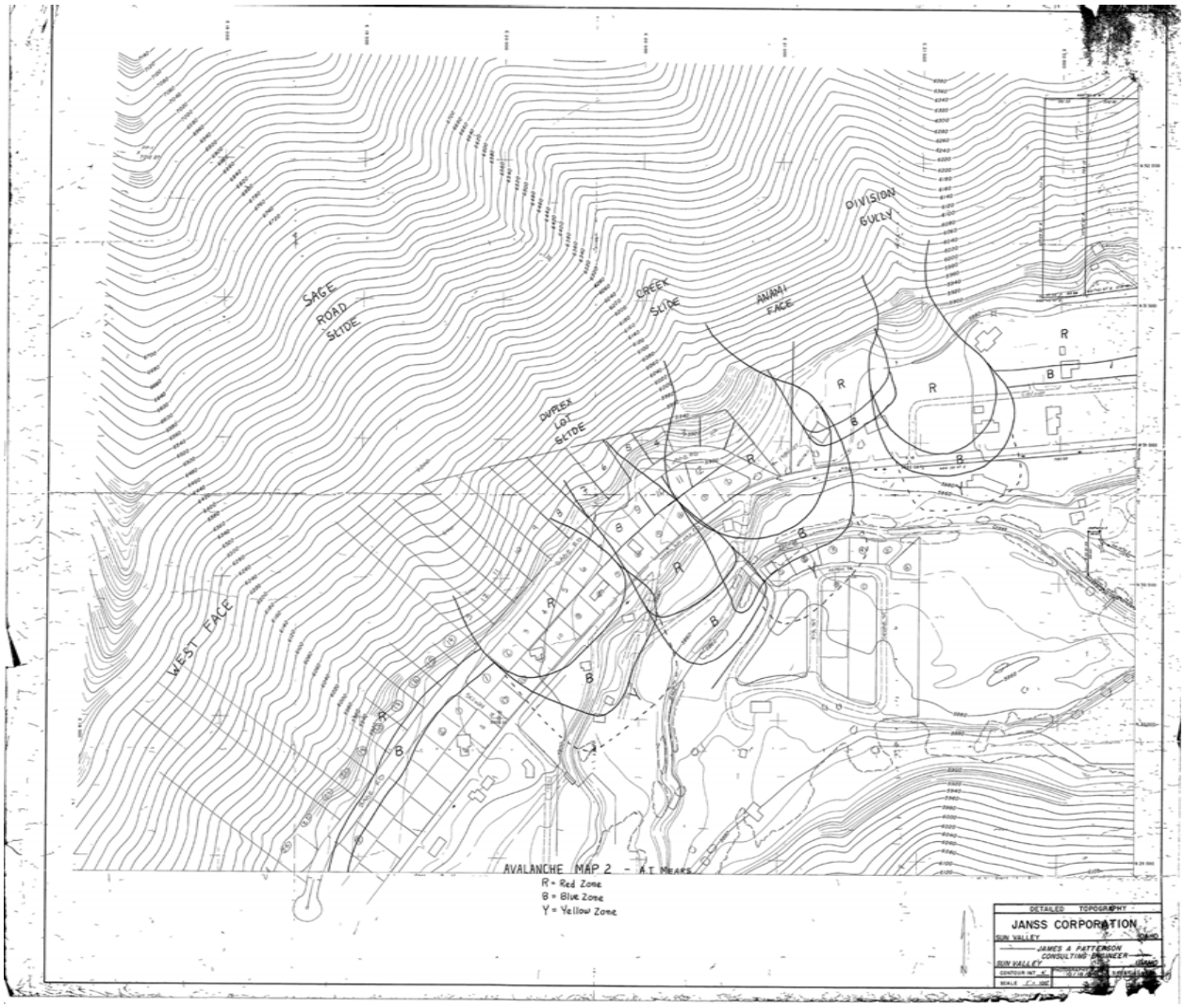


Figure 5 - Mears Avalanche Map 2 – Circa 1978

SITE ANALYSIS

The best method for determining avalanche runout distance (which is of primary importance to man and his activities) is a long (300 year) history of past events at the site. If this is not available, the next step is to look for damage to trees and other vegetation along the track and runout zone. This particular site does not lend itself to dendrochronology, due to minimal vegetation consisting of mostly grasses and sagebrush with a few small, scattered Fir and Aspen.

The next step is terrain analysis and applying statistical methods developed by mapping hundreds of avalanches around the world and comparing these figures to a local data set to determine runout distance. These results are compared with accepted avalanche dynamics modeling software, RAMMS: AVALANCHE (Rapid Mass Movement Simulation), developed by the Swiss Federal Institute for Snow and Avalanche Research to calculate approximate flow depths, velocities, pressures, and potential impact forces that may be expected. Both the Statistical and Dynamic Models are used in this report with the RAMMS model taking precedence as it shows velocities, pressures, and flow depths along the path and the lateral extents.

Blaine County is typically under the influence of Intermountain climatic factors, which usually result in a comparatively shallow snowpack, and cold temperatures; perfect conditions for creating the usual and expected temperature gradient layers (T.G., Kinetic, Facets or "sugar snow") resulting in a weak snowpack structure. This fact, coupled with occasional large Pacific storm events, and the necessary terrain characteristics, result in the occasional avalanches that are observed.

Figure 6 - Looking Uphill from Proposed Building Site.

The slope above the site is a combination of a broad unconfined face and a channelized path. Both lie at a typical slope angle of around 32 degrees that steepens up to 38 degrees as it nears the toe of the slope. The projected avalanche path is short and steep with a slight channel above the subject property that will direct larger avalanche events into the proposed building area. The slope does not lend itself to deep snow wind loading as typical on the Westerly side of many of the channelized paths in the Warm Springs area, but the steep nature of the immediate terrain creates the potential for avalanche danger.

LAND PLANNING RECOMMENDATIONS

Please refer to the attached 1" = 40', 1" = 10', and Avalanche Forces "A Snow Avalanche Hazard Study Showing Lot 23, Blk 3, Warm Springs Village Subdivision, 4th Addition" maps by Alpine Enterprises Inc. for the following discussion.

The Red Zone shown will affect only the most northwestern corner of the proposed avalanche protection wall, while the remainder of the proposed structures and driveways lie in the Blue Zone that stops within Sage Road. To ensure the building will remain deflection neutral, the northwestern portion of the structure was designed in such a way that the potential avalanche runout will become entrapped behind the structure. This creates the possibility for the potential avalanche impact pressures to exceed what would commonly be found in Blue Hazard Areas and as a result the projected impact pressures were increased to be within the Red Hazard Area classification.

We have worked with the Owners, the Designers at Farmer Payne Architects, and Structural Engineer at Maxwell SDS to make this an avalanche aware design from the inception. Numerous meetings with the Owners, Farmer Payne Architects, and Maxwell SDS have resulted in what we believe to be the best location, orientation, and design for the proposed residence. The goal was to keep the structure and its surrounding property as safe as possible while still maintaining the Owners vision for their property. An important aspect of the design was to be deflection neutral and act as a mitigation structure to add an element of safety to the existing down path residences. The proposed structure was oriented in a manner that will entrap the potential avalanche runout in order to not deflect avalanche runout towards the property of others. Any snow momentarily deflected by the structure will be immediately entrained by the rest of the slide as it passes by ensuring there will not be increased risks to neighboring properties. The structure was also located immediately adjacent to the minimum front yard setback in an attempt to reduce the potential avalanche forces associated with Red Hazard Zones. It should be remembered that persons and property inside an avalanche resistant structure will be safe from avalanche danger, but persons or property on the outside of a proposed structure could be at risk.

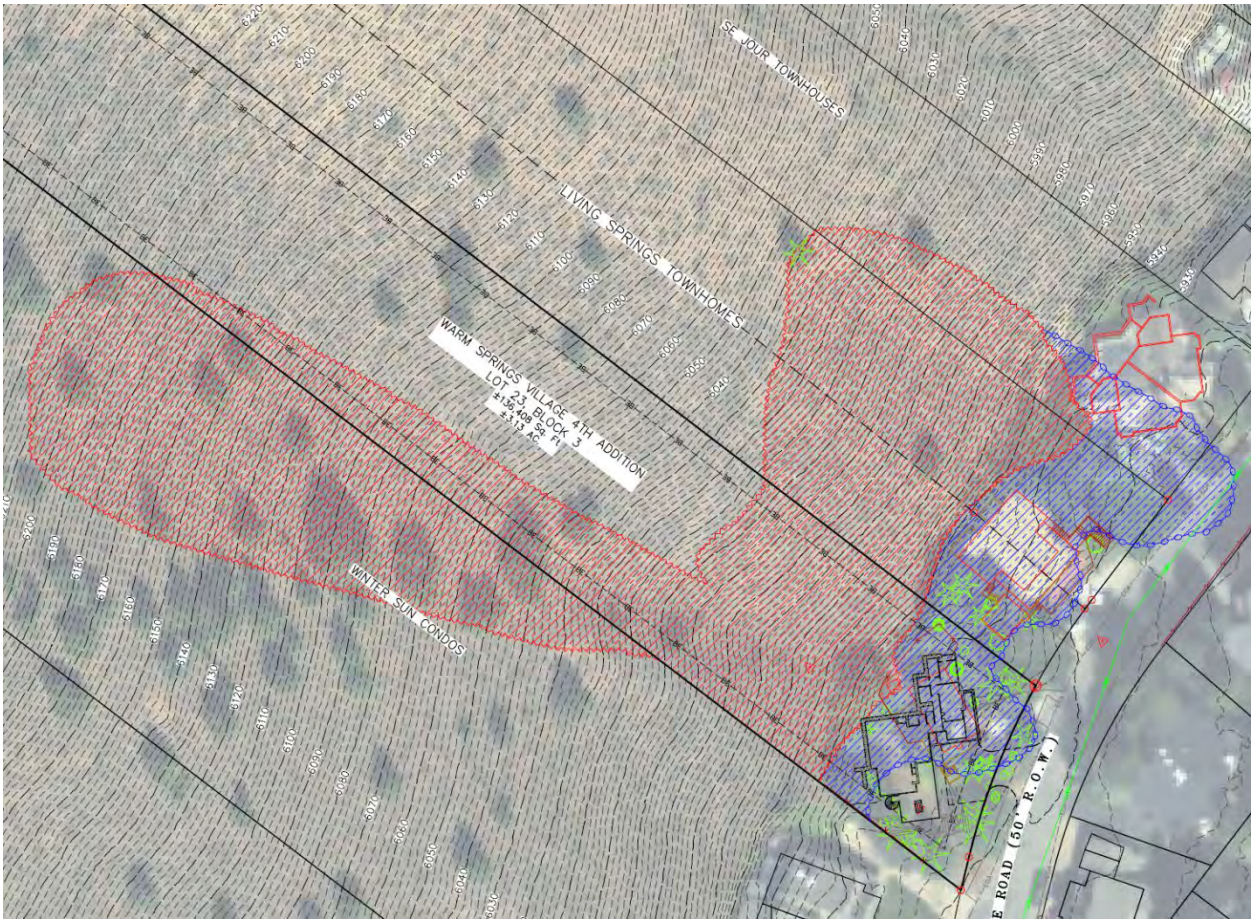


Figure 7 – A 2022 Avalanche Hazard Map showing the subject property, 406 Sage Rd.

This report should be considered site specific in that avalanche forces and return periods at this site should not be applied to other sites.

The Sawtooth Avalanche Center maintains a daily avalanche hazard forecast during winter months on the internet at SawtoothAvalanche.com that should be referred to frequently, and official warnings should be heeded during periods of high hazard. A daily subscription via email is also available.

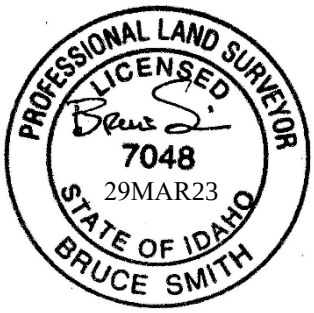
As Pete Schaerer suggests in *The Handbook of Snow*: "the technical work required to identify dangerous zones can be carried out with reasonable accuracy using the procedures outlined above. Determination of acceptable risk and the enforcement of building restrictions are political and legal matters."

In conclusion, it is recommended that structures in this area be carefully positioned, oriented, and designed; and that the residents of this area possess at least a basic knowledge of conditions that may lead to an avalanche event, and use this knowledge to protect themselves, family, visitors, structures, the public, and property. As long as the City allows development in the High Hazard Zones, we do feel that the owners have a vested right to responsibly develop this property. Dwelling in this area may be considered an acceptable risk for those who are aware of the hazard, have a basic understanding of conditions that could result in an avalanche event, and are willing to accept the occasional risk. The Developer, Owner, and the City should be aware of, and willing to accept, all possible legal, moral, financial, political, ethical, and safety consequences that may result from structures being located within High Avalanche Hazard Zones.

Respectfully submitted,

Bruce Smith, PLS 7048, Idaho

Alex Nelson, PE 19275, Idaho



Alpine Enterprises, Inc.

Ketchum, Idaho

REFERENCES

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BURROWS, C.J. and V.L.

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KETCHUM COMMUNITY LIBRARY

Regional History Department

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NGI CALCULATIONS

Client/Site	Sage Mountainside Townhomes		
Date	11/8/2022		
		Horizontal	
Input Parameters (yellow):		**Distance**	**Elevation**
Avalanche Path Profile		**(X) (ft)**	**(Y) (ft)**
Top of starting zone (X_1, Y_1)		**0**	6220
10° point (X_β, Y_β)		522	5940
θ, slope angle (°) top 100 m (vert.)			29.50
Calculated Parameters (green and red):			
β, ave. slope < to 10° point			28.209
H, vert. distance (0,0 to end parabola (ft)			85.344

X_r (ft)	dX (ft)	dX + 1SD (ft)	
590	68	107	**Equation 2**
594	72	115	**Equation 3**
861	139	190	**Equation 3B**
566	44	112	**Equation 5**
723	201	257	**Equation 7**
Mean	**105**	**156**	**All Equations**
Mean	**113**	**167**	**All Equations except Eq. 3**

Figure 8 - NGI Calculation Sheet

RAMMS ::AVALANCHE DATA

Avalanche simulations were run for twelve different circumstances. Path “R7_T300_SHORT” represents the 300-Year Event that is considered to be an accurate representation of the potential design event. Existing vegetation and structures were ignored due to uncertainties in future site conditions.

Figure 9 - Release Area, R7, 2D

Figure 10 - Release Area, R7, 3D

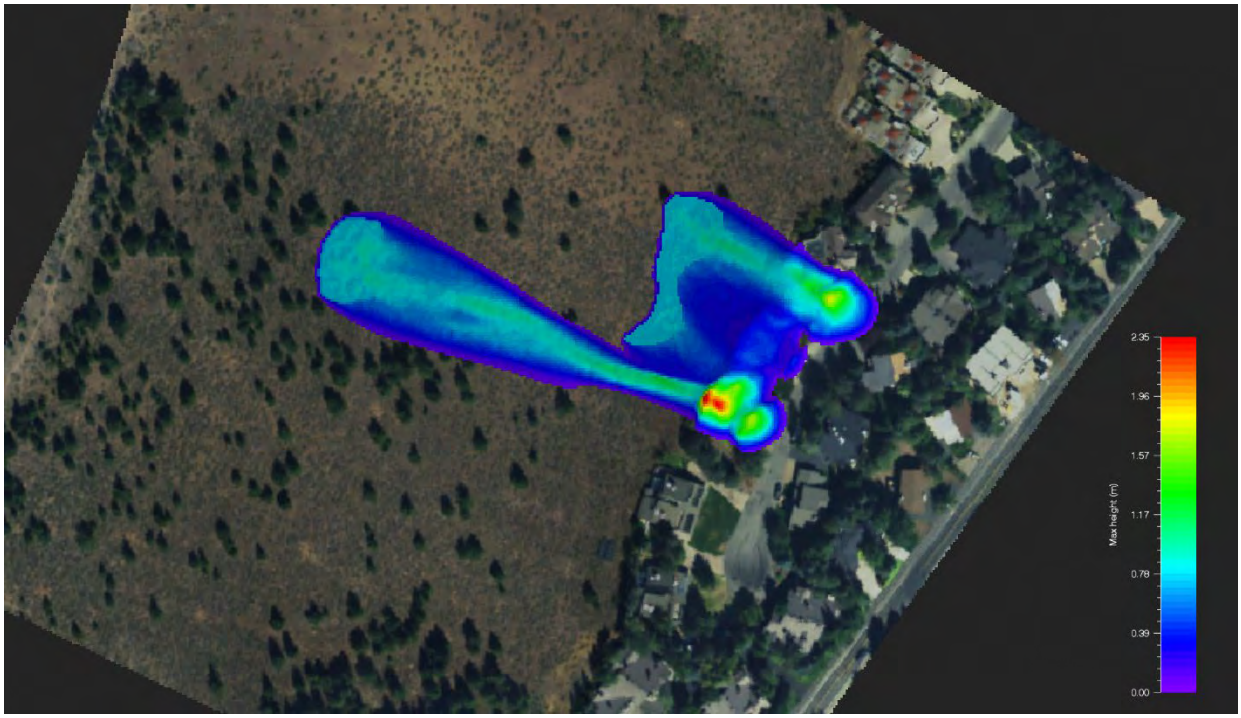


Figure 11 - Path_R7_T300_SHORT - Maximum Flow Height, 2D

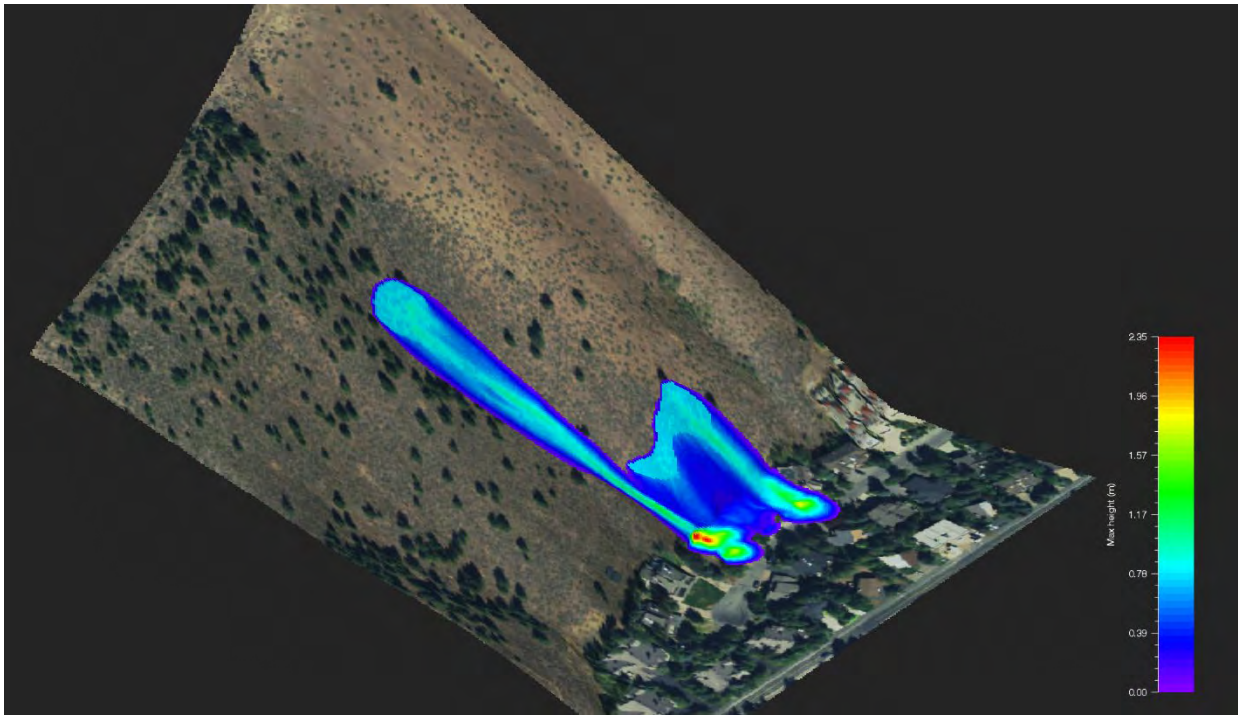


Figure 12 - Path_R7_T300_SHORT - Maximum Flow Height, 3D

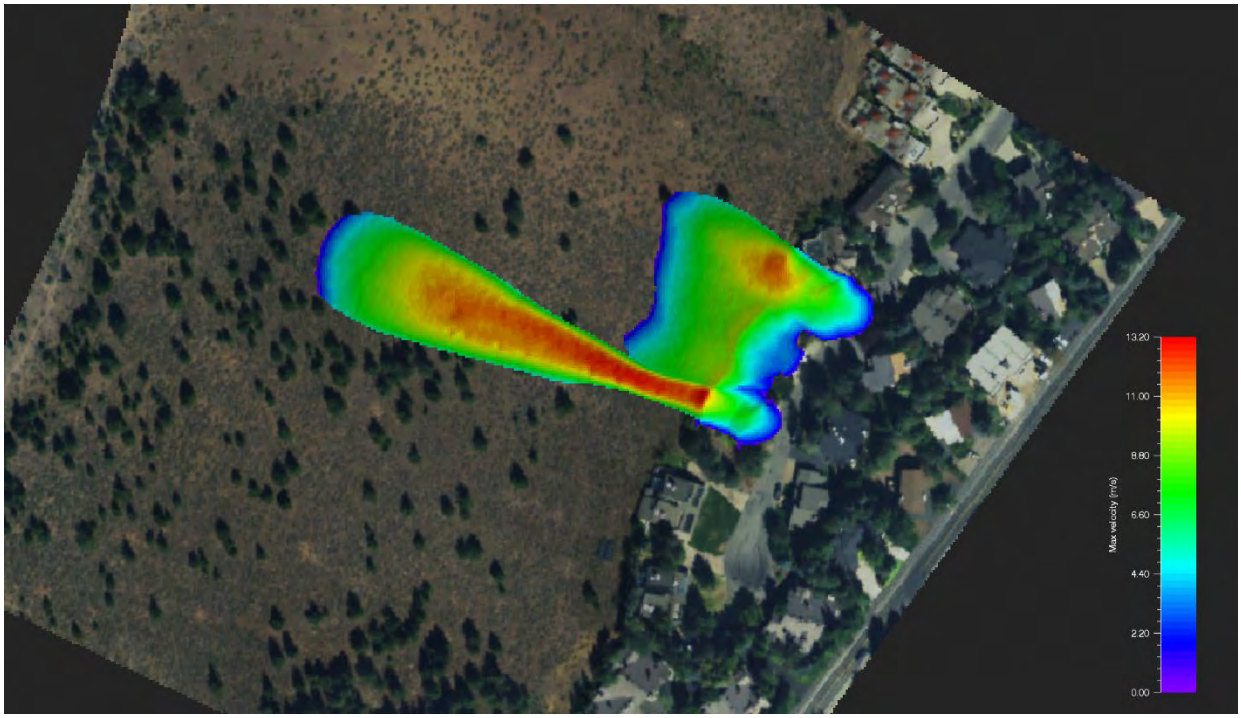


Figure 13 - Path_R7_T300_SHORT - Maximum Velocity, 2D

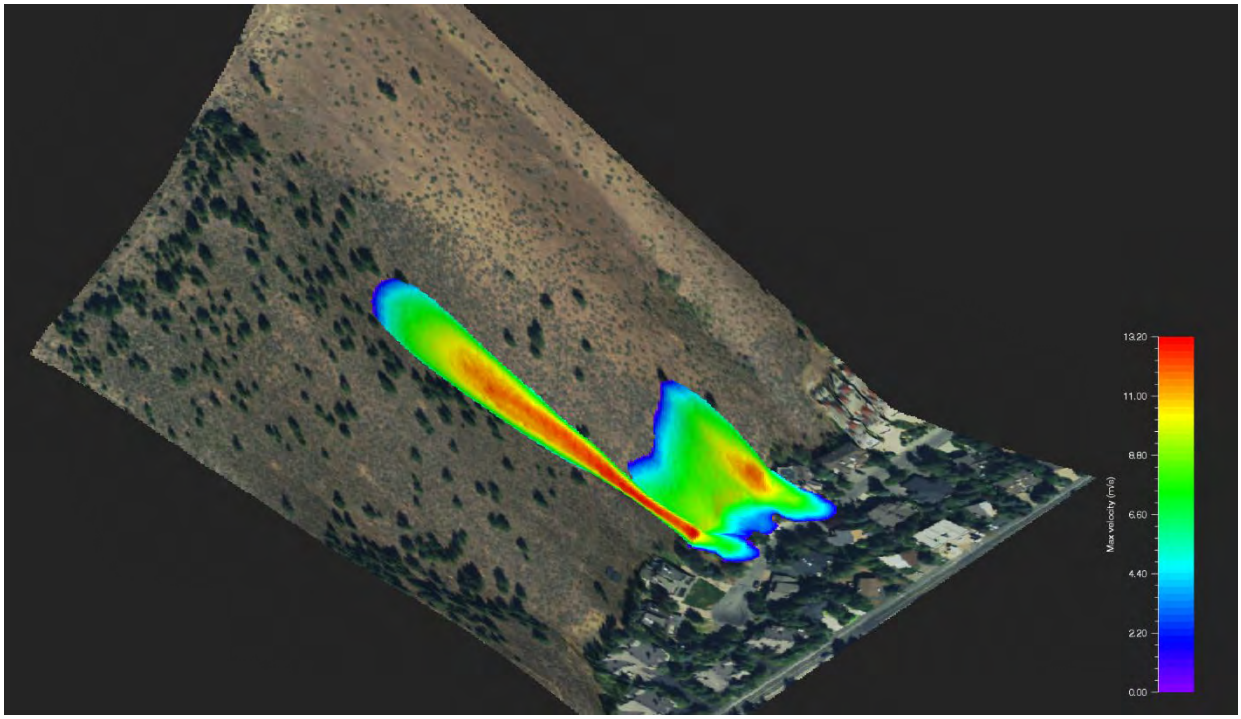


Figure 14 - Path_R7_T300_SHORT *- Maximum Velocity, 3D*

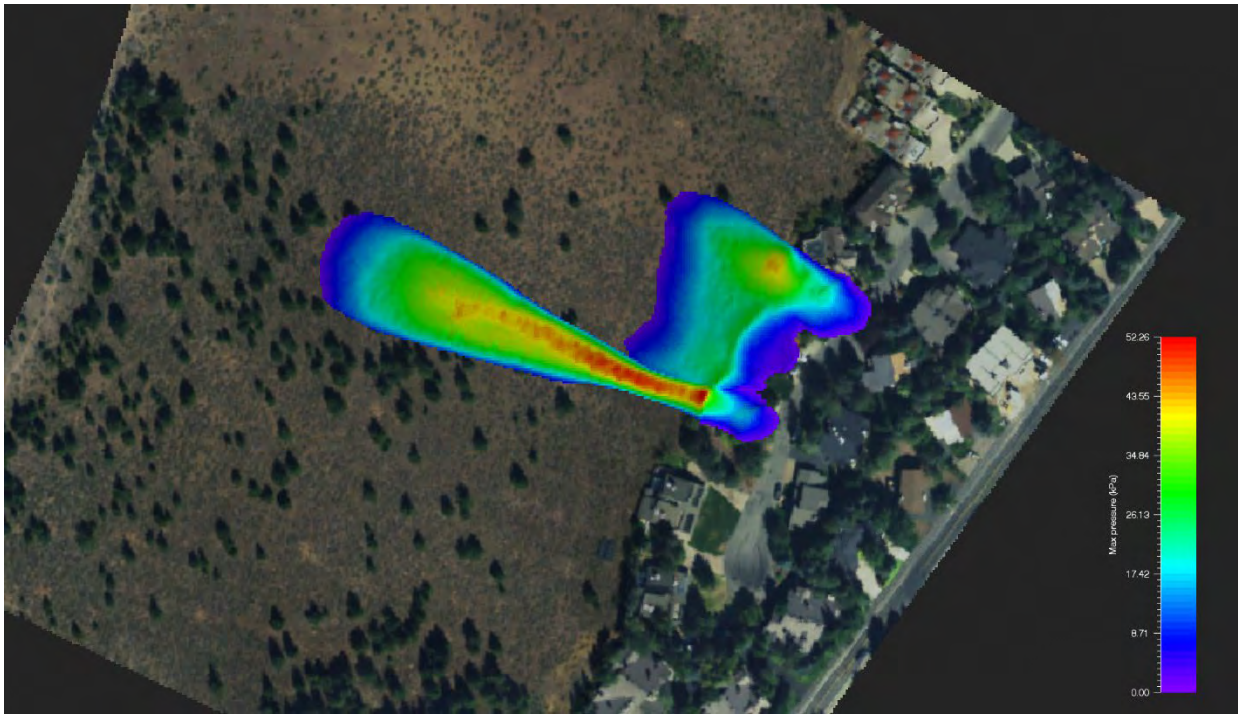


Figure 15 - Path_R7_T300_SHORT - Maximum Pressure, 2D

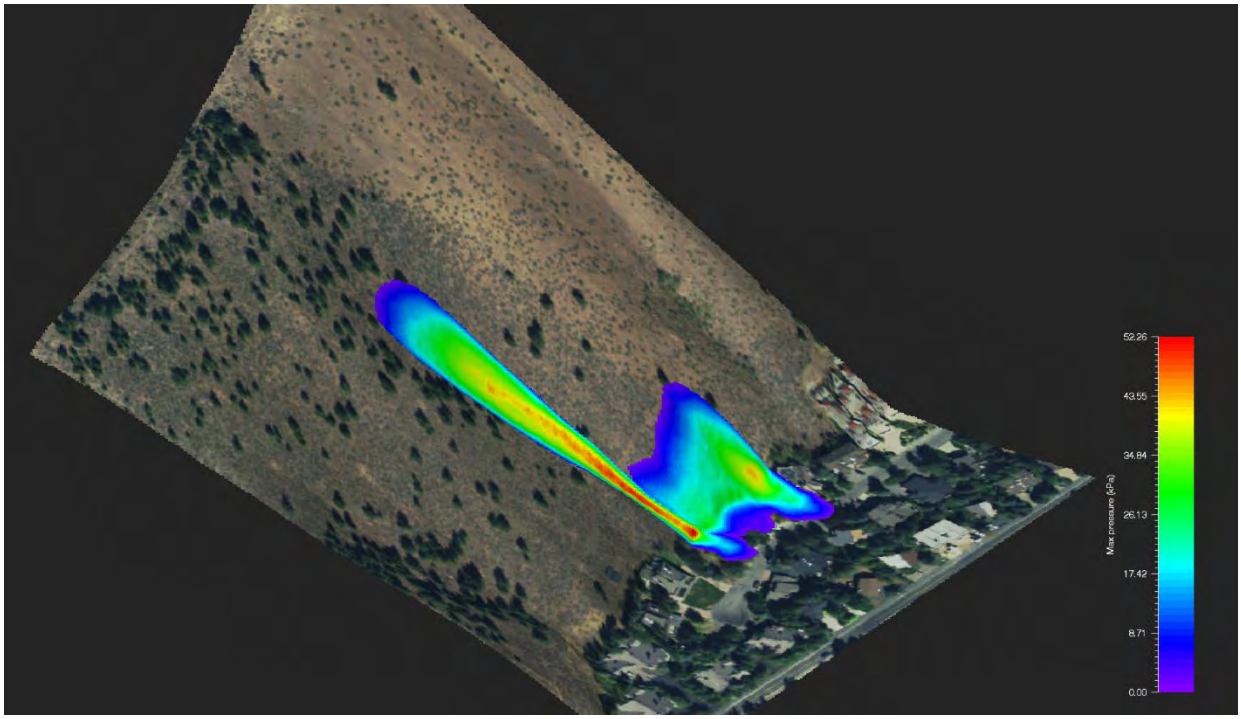


Figure 16 - Path_R7_T300_SHORT - Maximum Pressure, 3D

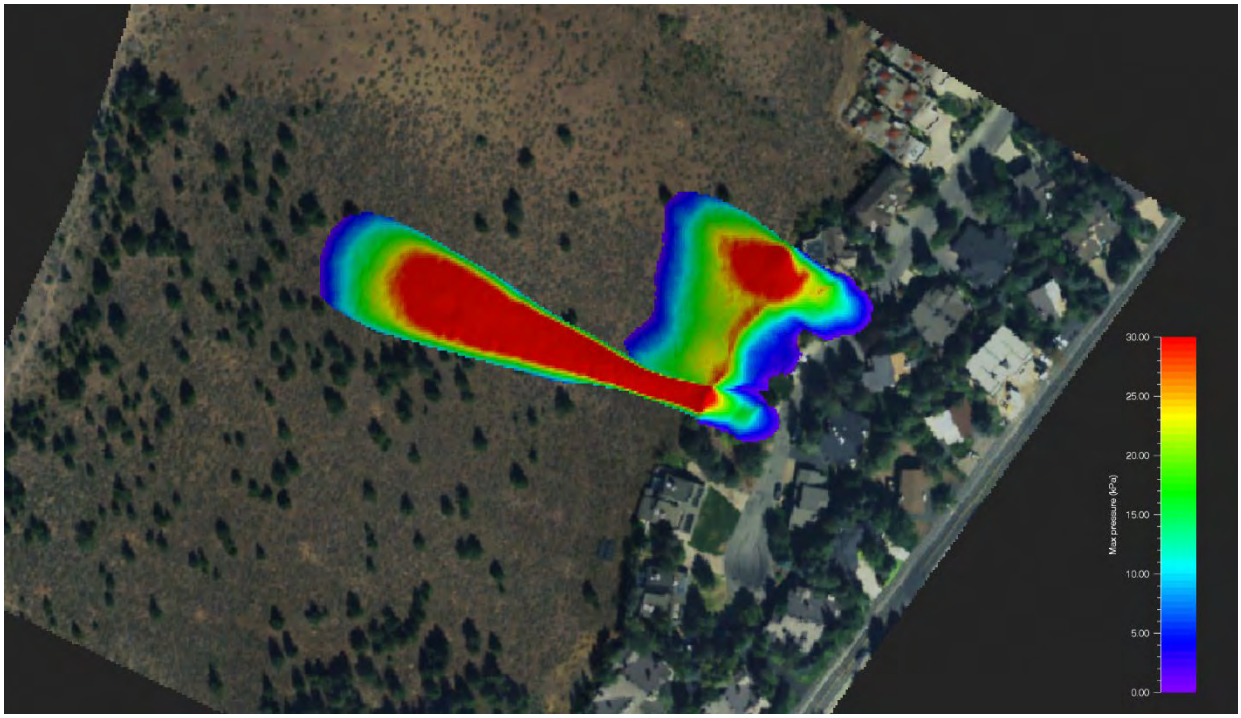


Figure 17 - Path_R7_T300_SHORT - Maximum Pressure – Red Zone, 2D

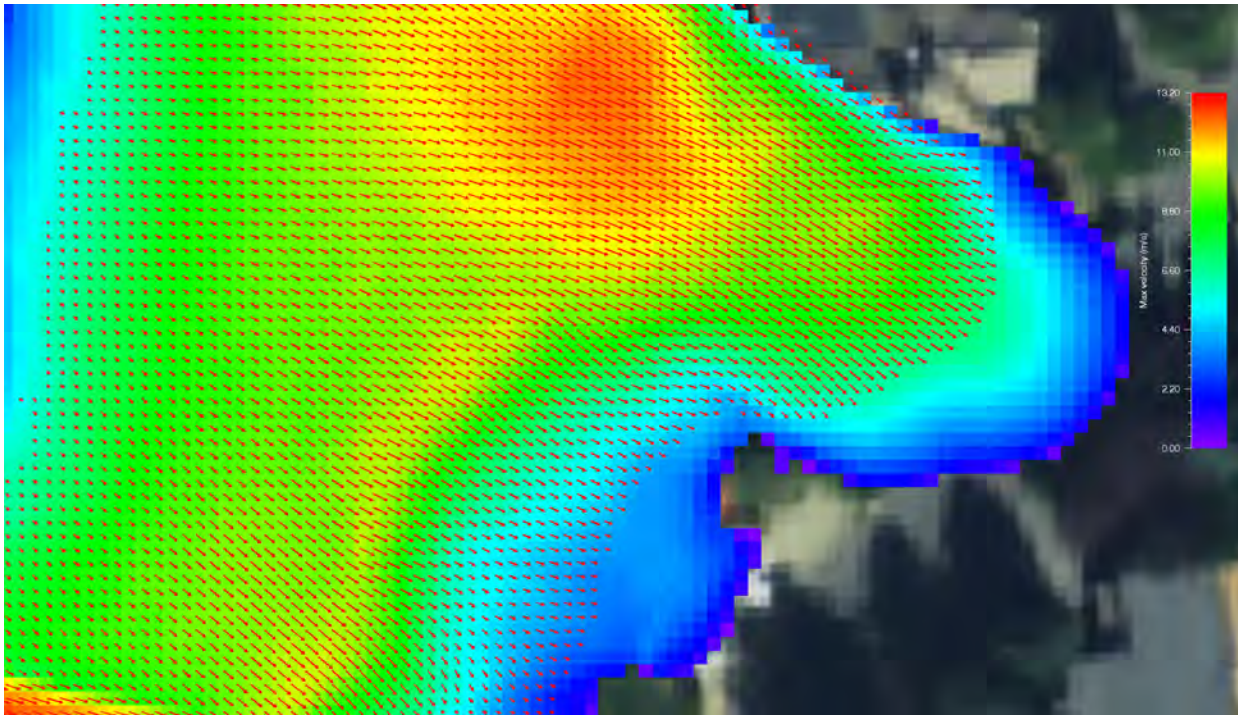


Figure 18 - Path_R7_T300_SHORT – Velocity Vectors – Time Step 21 Sec, 2D

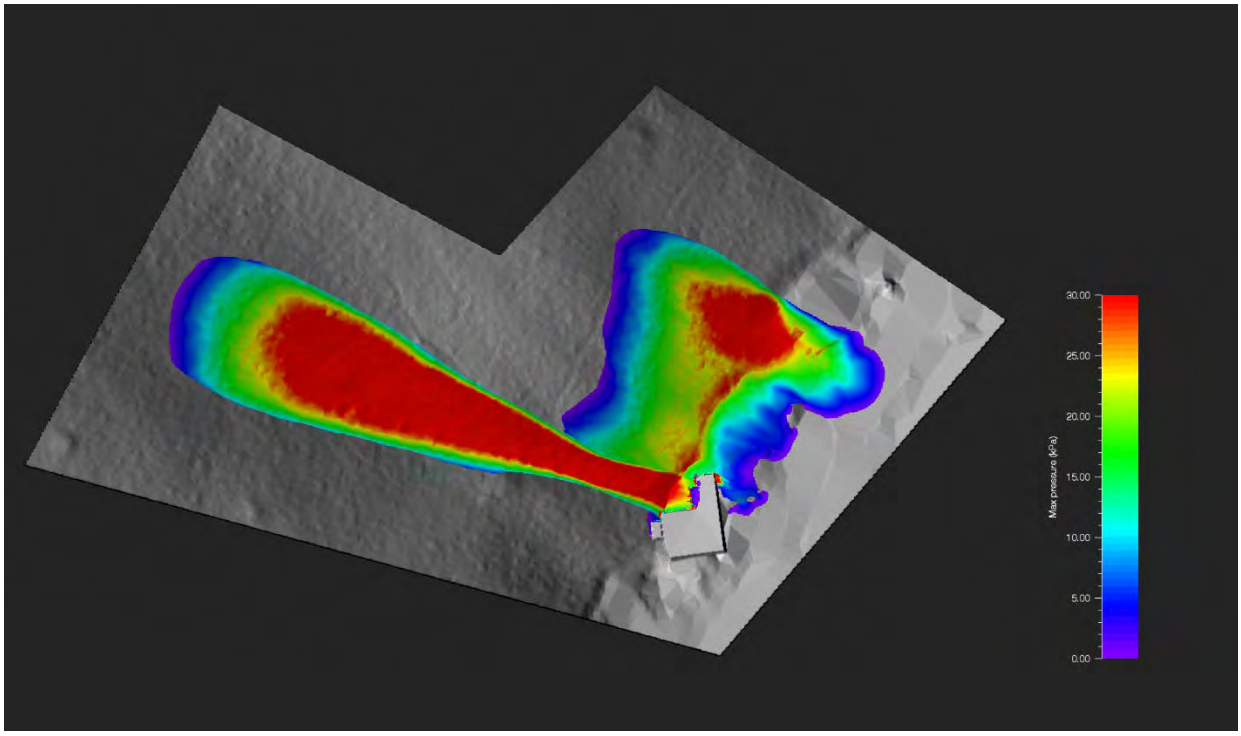


Figure 19 - Path_R7_T300_SHORT – Proposed Structure Included - Maximum Pressure – Red Zone, 2D

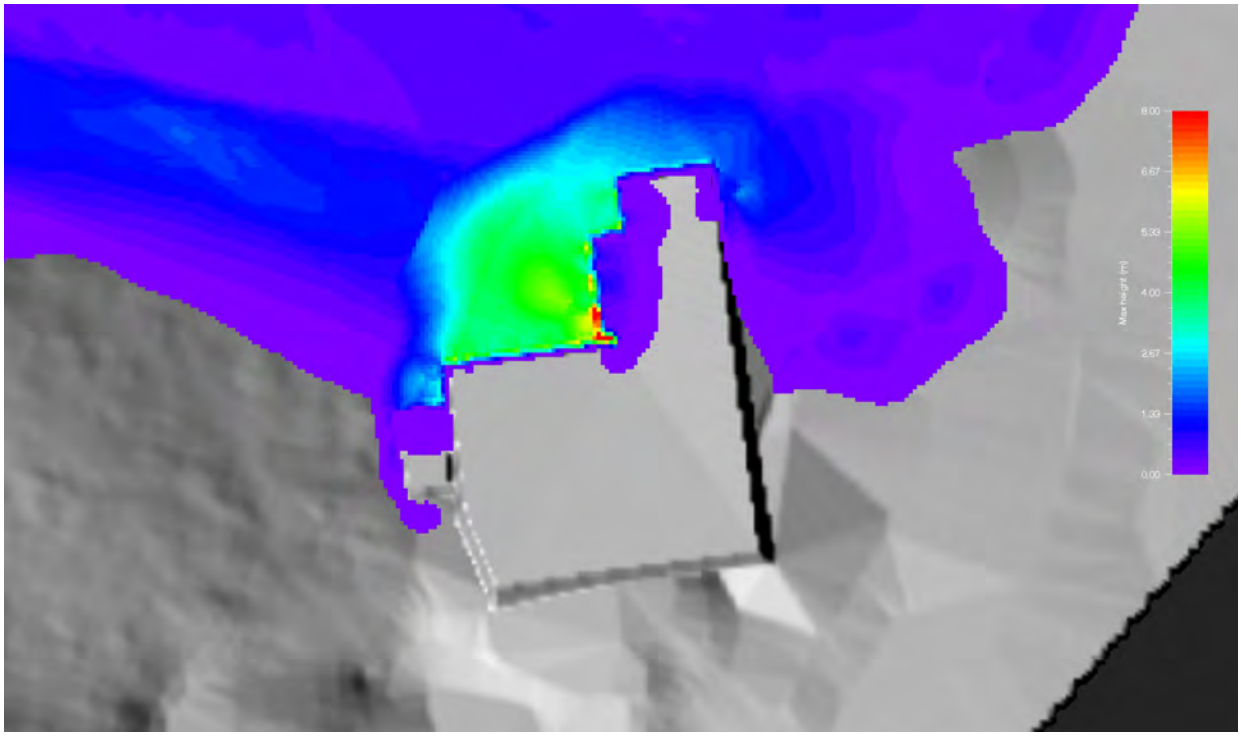


Figure 20 - Path_R7_T300_SHORT – Proposed Structure Included, Maximum Flow Height, 2D

PATH : R5-S300 LOG FILE

****
RAMMS::AVALANCHE RAMMS OUTPUT LOGFILE

Output filename: U:\LD3\214_L22B3WSV4\RAMMS_2022\214_LS_AVY2022\R7_T300_SHORT.out.gz

Simulation stopped due to LOW FLUX!

Simulation stopped after 32.0000s
Calculation time (min.): 1.15

Simulation resolution (m): 1.00

SIMULATION RESULTS

Number of cells: 135121
Number of nodes: 136119

Calculated Release Volume (m3): 597.818

Overall MAX velocity (m/s): 13.1985
Overall MAX flowheight (m): 2.34986
Overall MAX pressure (kPa): 52.2603

****
RAMMS::AVALANCHE 1.7.20 INPUT LOGFILE

Date: Fri May 20 15:05:21 2022
Input filename: U:\LD3\214_L22B3WSV4\RAMMS_2022\214_LS_AVY2022\R7_T300_SHORT.av2

Project: 214_LS_AVY2022
Details:
214 Living Springs Townhomes
Avalanche 2022
1m Grid

DEM / REGION INFORMATION:
DEM file: U:\LD3\214_L22B3WSV4\RAMMS_2022\214_LS_AVY2022\214_LS_AVY2022.xyz
DEM resolution (m): 1.00
(imported from: U:\LD3\214_L22B3WSV4\RAMMS_2022\214_LivingSprings_Grid_1M_ACCII.asc)

Nr of nodes: 599676
Nr of cells: 598125

Project region extent:
E - W: 467762.45 / 466937.45
S - N: 224076.43 / 224801.43

CALCULATION DOMAIN:
U:\LD3\214_L22B3WSV4\RAMMS_2022\214_LS_AVY2022\D2.dom

GENERAL SIMULATION PARAMETERS:
Simulation time (s): 300.000
Dump interval (s): 0.50
Stopping criteria (momentum threshold) (%): 5
Constant density (kg/m3): 300

NUMERICS:
Numerical scheme: SecondOrder
H Cutoff (m): 0.000001
Curvature effects are ON!

RELEASE:
Depth: 0.75 m Vol: 597.8 m3 Delay: 0.00 s Name: R7_1.shp
Depth: 0.75 m Vol: 792.1 m3 Delay: 13.00 s Name: R7_2.shp
Estimated release volume: 1389.89 m3

FRICTION MUXI:
Altitude_limit_1: 1500 m a.s.l
Altitude_limit_2: 1000 m a.s.l
Format of following parameters: [< 1000] - [1000 - 1500] - [> 1500]

Open slope parameters:
Mu: 0.300 - 0.290 - 0.320
Xi: 1250 - 1400 - 1200
Channelled parameters:
Mu: 0.340 - 0.330 - 0.360
Xi: 1050 - 1180 - 1000
Gully parameters:
Mu: 0.440 - 0.430 - 0.360
Xi: 900 - 1000 - 800
Flat parameters:
Mu: 0.280 - 0.270 - 0.260
Xi: 1500 - 1600 - 1750
Forest parameters:
Mu (delta): 0.020 - 0.020 - 0.020
Xi: 400 - 400 - 400

RETURN PERIOD (y): 300
VOLUME category: Tiny

COHESION:
No COHESION specified.

MAP / ORTHOPHOTO INFO:
Map file: U:\LD3\214_L22B3WSV4\RAMMS_2022\AerialImagery\NAIP2021.tif
OrthoPhoto file: U:\LD3\214_L22B3WSV4\RAMMS_2022\AerialImagery\NAIP2021.tif

LEGEND

- Subject Boundary
- Adjoiners Boundary
- Existing Edge of Asphalt Roadway
- Building Setback (See Note 5)
- 10' Major Contour Line (Blaine County LiDAR)
- 2' Minor Contour Line (Blaine County LiDAR)
- Existing Structure
- Existing Deck
- Existing Concrete/Driveway
- Red Avalanche Hazard Zone (Alpine 2022)
- Blue Avalanche Hazard Zone (Alpine 2022)
- Proposed Structure
- Proposed Driveway
- Proposed Landscaping
- Found 1/2" Rebar
- Found Aluminum Cap
- Set 1/2" Rebar, PLS 7048
- Existing Conifer Tree
- Existing Deciduous Tree

NOTES

1) Basis of Bearings is Idaho State Plane Coordinate System, NAD83, Central Zone, at Grid in US Survey Feet. Vertical Datum is NAVD1988.
2) Boundary Information is from the Plats of Warm Springs Village Subdivision, Fourth Addition, Instrument Number 115701; Winter Sun Condominium, Instrument Number 210802; Living Springs Townhomes, Instrument Number 456235; Records of Blaine County, Idaho.
3) Refer to the Plat Notes, Conditions, Covenants, & Restrictions on the Original Plat.
4) Utility Locations shown are based on visual surface evidence and a DIGLINE INC. locate. Utility locations should be verified by DIGLINE INC. before any excavation.
5) Current Zoning appears to be General Residential Low Density, (GR-L). Please refer to City of Ketchum Zoning Ordinances for more information about this Zone. Front Setbacks are are as shown, Side Setbacks are the greater of 1' for every 3' in building height or 5'. Rear Setbacks are the greater of 1' for every 3' in building height or 15'.
6) Subject Property lies withing the City of Ketchum's Avalanche Zone District and Mountain Overlay Zoning District as defined in Zoning Code Title 15. Persons dwelling in this area should become familiar with these portions of the Ordinance and dwell here at their own risk.
7) Subject property lies within the Blaine County Elk Winter Range Zone.
8) Not all trees and vegetation are shown. Some locations are approximate.
9) Avalanche Zoning is from a 2022 RAMMS Study conducted by Alpine Enterprises Inc. This study is site specific; it should not be applied to adjacent lands.
10) Aerial Imagery, if shown, is from NAIP 2021.

NORTH

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

A SNOW AVALANCHE HAZARD STUDY SHOWING LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.

WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PREPARED FOR BRADLEY AND GAIL PRATT

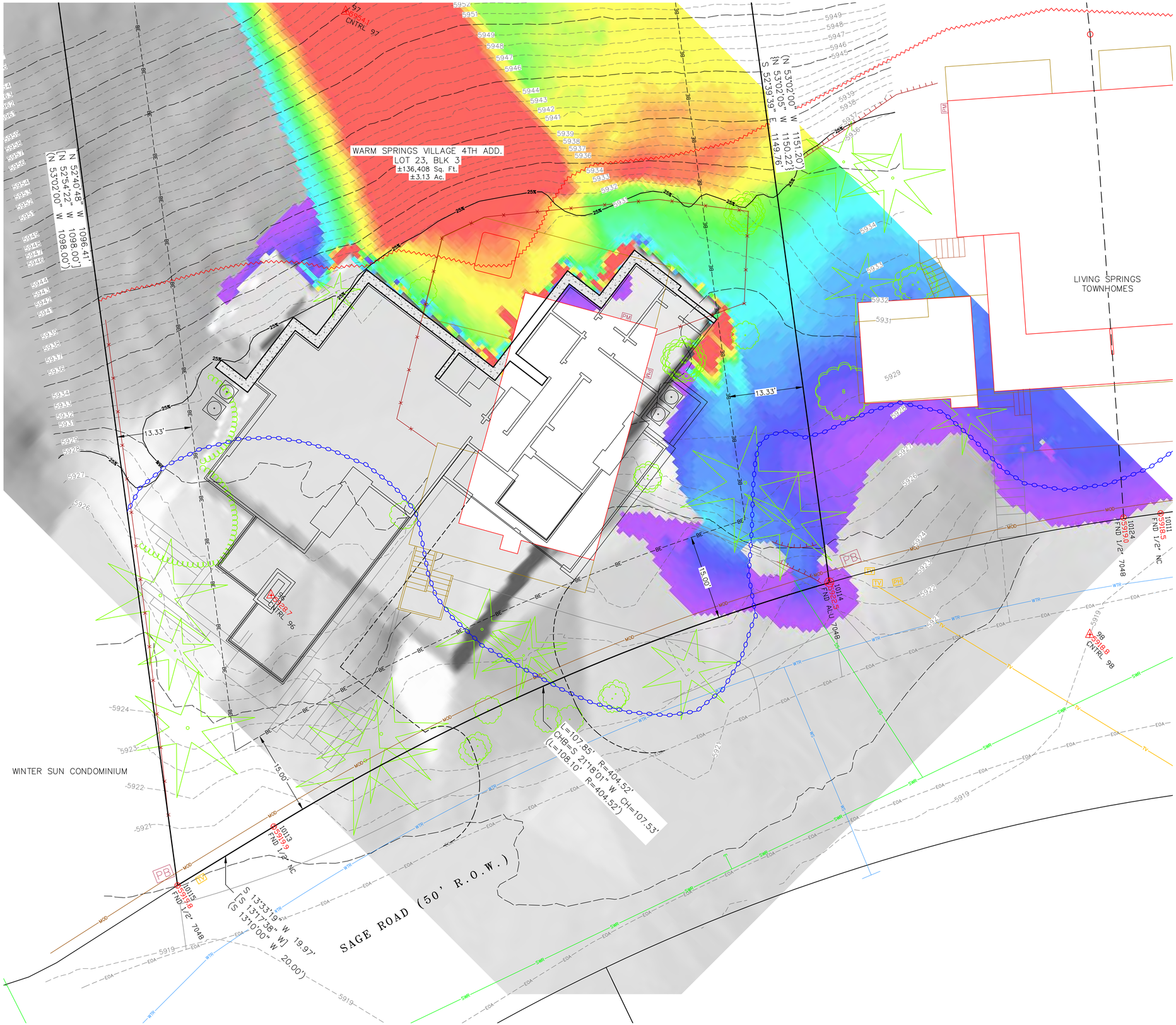
PROJECT PATH AND PRINT DATE U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_Avy2022.dwg 3/29/23 4:38:29 PM MST

REVISIONS	NO	DATE	BY

PROFESSIONAL LAND SURVEYOR — LICENSED — 7048 — 23MAR23 — STATE OF IDAHO — BRUCE SMITH

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering,
and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: barnthe@alpineenterprisesinc.com

SHEET 1 OF 4



LEGEND

- Subject Boundary
- Adjoiners Boundary
- Existing Edge of Asphalt Roadway
- Building Setback (See Note 5)
- Mountain Overlay District (City of Ketchum)
- 25% Slope Line (Alpine 2022)
- Existing 5' Major Contour Line (Alpine 2022)
- Existing 1' Minor Contour Line (Alpine 2022)
- Existing Structure
- Existing Deck
- Existing Concrete/Driveway
- Existing Retaining Wall
- Existing Overhead Power
- Existing Water Main
- Existing Water Service
- Existing Sewer Main
- Existing Sewer Service
- Existing CA/TV
- Existing Gas Main
- Red Avalanche Hazard Zone (Alpine 2022)
- Blue Avalanche Hazard Zone (Alpine 2022)
- Proposed Structure
- Proposed Driveway
- Proposed Landscaping
- Found 1/2" Rebar
- Found Aluminum Cap
- Set 1/2" Rebar, PLS 7048
- Existing Power Pole
- Existing Sewer Manhole
- Existing Water Meter
- Existing Water Valve
- Existing Well
- Existing Phone Box
- Existing CA/TV Box
- Existing Power Box
- Proposed Power Meter
- Existing Conifer Tree
- Existing Deciduous Tree

NOTES

1) Basis of Bearings is Idaho State Plane Coordinate System, NAD83, Central Zone, at Grid in US Survey Feet. Vertical Datum is NAVD1988.
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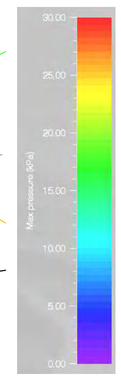


NORTH

GRAPHIC SCALE

8 0 4 8 16 32

(IN FEET)
1 inch = 8 ft.

A SNOW AVALANCHE HAZARD STUDY SHOWING LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD. WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO

PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering,
and Natural Hazards Consulting
660 Bell Dr., Unit 1
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL LAND SURVEYOR — LICENSED — 7048 — 29MAR23 — STATE OF IDAHO — BRUCE SMITH

NO	REVISIONS	DATE	BY

PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_Avy2022.dwg 3/29/23 4:38:29 PM MST

SHEET 2 OF 4

AVALANCHE IMPACT PRESSURES

P_n = NORMAL PRESSURE
P_s = SHEAR STRESS
P_v = UPLIFT PRESSURE
$P_n = \frac{1}{2} P_s = \frac{1}{2} P_v$

AVALANCHE FLOW DIRECTION

PLAN VIEW
SCALE: 1"=10'

NORTH ELEVATION
SCALE: 1"=10'

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

WEST WALLS
AVALANCHE PRESSURES
SCALE: 1"=10'

NORTH WALLS
AVALANCHE PRESSURES
SCALE: 1"=10'

A SNOW AVALANCHE HAZARD STUDY SHOWING
LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.
WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering,
and Natural Hazards Consulting
660 Bell Dr., Unit 1
Ketchum, ID 83340 USA
P.O. Box 2037, Ketchum, ID 83340
(208) 727-1988 727-1987 fax
email: esmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER
19275
29MAR23
STATE OF IDAHO
ALEX NELSON

NO	REVISIONS	DATE	BY

PROJECT PATH AND PRINT DATE U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_Avy2022.dwg 3/29/23 4:38:29 PM MST

SHEET 3 OF 4

AVALANCHE IMPACT PRESSURES

P_n = NORMAL PRESSURE
P_s = SHEAR STRESS
P_v = UPLIFT PRESSURE
$P_n = \frac{1}{2} P_s = \frac{1}{2} P_v$

METRIC

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Point	**Point Name**	**Velocity (V) (m/s)**	**Deflection Angle (θ) (°)**	**Depth Previous Snow and Avalanche Deposits (H_d) (m)**	**Design Avalanche Flow Depth (H_a) (m)**	**Design Avalanche Climbing Height on Deflecting Surface (H_r) (m)**	**Full Impact Height (m)**	**Total Climbing Height (H) (m) = $H_a + H_d + H_r$**	**Pressure (P_n) (kPa)**	**Normal Pressure (P_n) (kPa)**	**Shear Forces (Ps) (kPa) = (0.5)*(P_n)**	**Uplift Forces (Pv) (kPa) = (0.5)*(P_n)**	**Notes**
A	WEST WALL	3.2	64.0	1.00	1.15	0.41	2.15	2.56	3.0	2.42	1.21	1.21	Forces increase linearly along West Wall from A to B.
B	WEST WALL	6.5	64.0	1.00	0.80	1.72	1.80	3.52	12.5	10.10	5.05	5.05	Forces increase linearly along West Wall from A to B.
C	WEST WALL	6.5	64.0	1.00	0.40	1.72	1.40	3.12	12.5	10.10	5.05	5.05	Climb Heights decrease along West Wall from B to C.
D	WEST WALL	7.5	64.0	1.00	0.60	2.33	1.60	3.93	17.0	13.73	6.87	6.87	Forces act along West Wall D.
D	NORTH WALL	7.5	40.0	1.00	0.55	1.19	1.55	2.74	17.0	7.02	3.51	3.51	Forces increase linearly along North Wall from D to E.
E	NORTH WALL	7.3	90.0	1.00	0.60	2.72	1.60	4.32	16.0	16.00	8.00	8.00	Flow is confined.
E	WEST WALL	7.3	90.0	1.00	0.60	2.72	1.60	4.32	16.0	16.00	8.00	8.00	Flow is confined.
F	WEST WALL	9.1	64.0	1.00	0.65	3.43	1.65	5.08	25.0	20.20	10.10	10.10	Forces increase linearly along West Wall from E to F.
F	NORTH WALL	9.1	34.0	1.00	0.65	1.33	1.65	2.98	25.0	7.82	3.91	3.91	Forces increase linearly along North Wall from F to G.
G	NORTH WALL	8.9	90.0	1.00	0.75	4.08	1.75	5.83	24.0	24.00	12.00	12.00	Flow is confined.
G	WEST WALL	8.9	90.0	1.00	0.75	4.08	1.75	5.83	24.0	24.00	12.00	12.00	Flow is confined.
G	WEST WALL	8.9	90.0	1.00	0.75	4.08	1.75	5.83	24.0	24.00	12.00	12.00	Flow is confined.
H	WEST WALL	10.6	55.0	1.00	0.85	3.88	1.85	5.73	34.0	22.81	11.41	11.41	Forces decrease linearly along West Wall from G to H.
H	NORTH WALL	10.6	40.0	1.00	0.85	2.39	1.85	4.24	34.0	14.05	7.02	7.02	Forces decrease linearly along North Wall from H to J.
J	NORTH WALL	9.3	40.0	1.00	1.40	1.83	2.40	4.23	26.0	10.74	5.37	5.37	Forces increase linearly along North Wall from J to K.
K	NORTH WALL	10.5	90.0	1.00	2.25	5.61	3.25	8.86	33.0	33.00	16.50	16.50	Flow is confined.
K	WEST WALL	10.5	90.0	1.00	2.25	5.61	3.25	8.86	33.0	33.00	16.50	16.50	Flow is confined.
L	WEST WALL	10.8	90.0	1.00	2.25	5.95	3.25	9.20	35.0	35.00	17.50	17.50	Forces increase linearly along West Wall from K to L.
M	WEST WALL	10.6	90.0	1.00	1.40	5.78	2.40	8.18	34.0	34.00	17.00	17.00	Forces decrease linearly along West Wall from L to M.
M	NORTH WALL	7.5	52.0	1.00	1.40	1.79	2.40	4.19	17.0	10.56	5.28	5.28	Forces increase linearly along North Wall from M to N.
N	NORTH WALL	10.0	90.0	1.00	1.80	5.10	2.80	7.90	30.0	30.00	15.00	15.00	Flow is confined.
N	WEST WALL	10.0	90.0	1.00	1.80	5.10	2.80	7.90	30.0	30.00	15.00	15.00	Flow is confined.
P	WEST WALL	10.0	68.0	1.00	1.15	4.38	2.15	6.53	30.0	25.79	12.90	12.90	Forces decrease linearly along West Wall from N to P.
P	NORTH WALL	6.3	52.0	1.00	1.15	1.27	2.15	3.42	12.0	7.45	3.73	3.73	Forces decrease linearly along North Wall from P to Q.
Q	NORTH WALL	5.8	52.0	1.00	0.85	1.05	1.85	2.90	10.0	6.21	3.10	3.10	Force is constant along North Wall from Q to R.
R	NORTH WALL	5.8	52.0	1.00	0.75	1.05	1.75	2.80	10.0	6.21	3.10	3.10	Force is constant along North Wall from Q to R.

Note: Structures should be designed to withstand full Normal Pressures (kPa) (Column (k)) at Full Impact Height (m) (Column (h)) and decrease linearly to 0 kPa at Total Climbing Height (m) (Column (i)). Flow Density (ρ) = 300kg/m3 (Assumed for safety) Full Impact Height was assumed at 1.0m. Proposed building location is in Flow Channel and above Deposition Zone. Actual Full Impact Height will vary with avalanche size and runout distance.

IMPERIAL

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Point	**Point Name**	**Velocity (V) (mph)**	**Deflection Angle (θ) (°)**	**Depth Previous Snow and Avalanche Deposits (H_d) (ft)**	**Design Avalanche Flow Depth (H_a) (ft)**	**Design Avalanche Climbing Height on Deflecting Surface (H_r) (ft)**	**Full Impact Height (ft)**	**Total Climbing Height (H) (ft) = $H_a + H_d + H_r$**	**Pressure (P_n) (psf)**	**Normal Pressure (P_n) (psf)**	**Shear Forces (Ps) (psf) = (0.5)*(P_n)**	**Uplift Forces (Pv) (psf) = (0.5)*(P_n)**	**Notes**
A	WEST WALL	7.1	64.0	3.28	3.77	1.4	7.1	8.4	62.7	50.6	25.3	25.3	Forces increase linearly along West Wall from A to B.
B	WEST WALL	14.4	64.0	3.28	2.62	5.6	5.9	11.5	261.1	210.9	105.4	105.4	Forces increase linearly along West Wall from A to B.
C	WEST WALL	14.4	64.0	3.28	1.31	5.6	4.6	10.2	261.1	210.9	105.4	105.4	Climb Heights decrease along West Wall from B to C.
D	WEST WALL	16.8	64.0	3.28	1.97	7.7	5.2	12.9	355.1	286.8	143.4	143.4	Forces act along West Wall D.
D	NORTH WALL	16.8	40.0	3.28	1.80	3.9	5.1	9.0	355.1	146.7	73.3	73.3	Forces increase linearly along North Wall from D to E.
E	NORTH WALL	16.3	90.0	3.28	1.97	8.9	5.2	14.2	334.2	334.2	167.1	167.1	Flow is confined.
E	WEST WALL	16.3	90.0	3.28	1.97	8.9	5.2	14.2	334.2	334.2	167.1	167.1	Flow is confined.
F	WEST WALL	20.4	64.0	3.28	2.13	11.3	5.4	16.7	522.1	421.8	210.9	210.9	Forces increase linearly along West Wall from E to F.
F	NORTH WALL	20.4	34.0	3.28	2.13	4.4	5.4	9.8	522.1	163.3	81.6	81.6	Forces increase linearly along North Wall from F to G.
G	NORTH WALL	20.0	90.0	3.28	2.46	13.4	5.7	19.1	501.2	501.2	250.6	250.6	Flow is confined.
G	WEST WALL	20.0	90.0	3.28	2.46	13.4	5.7	19.1	501.2	501.2	250.6	250.6	Flow is confined.
G	WEST WALL	20.0	90.0	3.28	2.46	13.4	5.7	19.1	501.2	501.2	250.6	250.6	Flow is confined.
H	WEST WALL	23.8	55.0	3.28	2.79	12.7	6.1	18.8	710.1	476.5	238.2	238.2	Forces decrease linearly along West Wall from G to H.
H	NORTH WALL	23.8	40.0	3.28	2.79	7.8	6.1	13.9	710.1	293.4	146.7	146.7	Forces decrease linearly along North Wall from H to J.
J	NORTH WALL	20.8	40.0	3.28	4.59	6.0	7.9	13.9	543.0	224.4	112.2	112.2	Forces increase linearly along North Wall from J to K.
K	NORTH WALL	23.5	90.0	3.28	7.38	18.4	10.7	29.1	689.2	689.2	344.6	344.6	Flow is confined.
K	WEST WALL	23.5	90.0	3.28	7.38	18.4	10.7	29.1	689.2	689.2	344.6	344.6	Flow is confined.
L	WEST WALL	24.2	90.0	3.28	7.38	19.5	10.7	30.2	731.0	731.0	365.5	365.5	Forces increase linearly along West Wall from K to L.
M	WEST WALL	23.8	90.0	3.28	4.59	19.0	7.9	26.8	710.1	710.1	355.1	355.1	Forces decrease linearly along West Wall from L to M.
M	NORTH WALL	16.8	52.0	3.28	4.59	5.9	7.9	13.8	355.1	220.5	110.2	110.2	Forces increase linearly along North Wall from M to N.
N	NORTH WALL	22.4	90.0	3.28	5.91	16.7	9.2	25.9	626.6	626.6	313.3	313.3	Flow is confined.
N	WEST WALL	22.4	90.0	3.28	5.91	16.7	9.2	25.9	626.6	626.6	313.3	313.3	Flow is confined.
P	WEST WALL	22.4	68.0	3.28	3.77	14.4	7.1	21.4	626.6	538.6	269.3	269.3	Forces decrease linearly along West Wall from N to P.
P	NORTH WALL	14.1	52.0	3.28	3.77	4.2	7.1	11.2	250.6	155.6	77.8	77.8	Forces decrease linearly along North Wall from P to Q.
Q	NORTH WALL	12.9	52.0	3.28	2.79	3.5	6.1	9.5	208.9	129.7	64.8	64.8	Force is constant along North Wall from Q to R.
R	NORTH WALL	12.9	52.0	3.28	2.46	3.5	5.7	9.2	208.9	129.7	64.8	64.8	Force is constant along North Wall from Q to R.

Note: Structures should be designed to withstand full Normal Pressures (psf) (Column (k)) at Full Impact Height (ft) (Column (h)) and decrease linearly to 0 psf at Total Climbing Height (ft) (Column (i)). Flow Density (ρ) = 300kg/m3 (Assumed for safety) Full Impact Height was assumed at 3.3ft. Proposed building location is in Flow Channel and above Deposition Zone. Actual Full Impact Height will vary with avalanche size and runout distance.

A SNOW AVALANCHE HAZARD STUDY SHOWING
LOT 23, BLOCK 3, WARM SPRINGS VILLAGE SUBD., 4TH ADD.
WITHIN S11 & S14, T.4N., R.17E., B.M., CITY OF KETCHUM, BLAINE COUNTY, IDAHO
PREPARED FOR BRADLEY AND GAIL PRATT

Alpine Enterprises Inc.
Surveying, Mapping, Civil Engineering,
and Natural Hazards Consulting
660 Bell Dr., Unit 1 Ketchum, ID 83340 USA
P.O. Box 2037, Ketchum, ID 83340 USA
(208) 727-1988 727-1987 fax
email: bsmith@alpineenterprisesinc.com

PROFESSIONAL ENGINEER LICENSED 9275 29MAR23 STATE OF IDAHO ALEX NELSON

REVISIONS	NO	DATE	BY

PROJECT PATH AND PRINT DATE: U:\LD3\214_L22B3WSV4\dwg\CS_214_Pratt_WSV4th_Blk3Lt23_Avy2022.dwg 3/29/23 4:38:29 PM MST

SHEET 4 OF 4

MAXWELL
STRUCTURAL DESIGN STUDIO

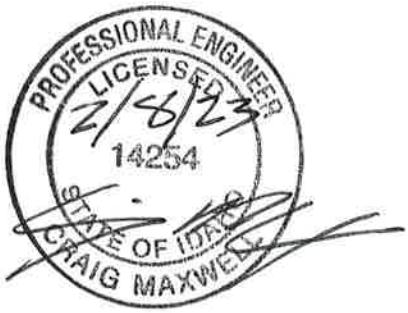
STRUCTURAL CALCULATIONS **February 08, 2023**

Pratt Residence

406 Sage Rd, Ketchum, Idaho

Structural Design Calculations

Structural Engineer:
Craig Maxwell P.E. #14254
Maxwell Structural Design Studio
105 Lewis Street, Suite 205
Ketchum, Idaho. 83340



MAXWELL
STRUCTURAL DESIGN STUDIO

Calculations Table of Contents

MAXWELL
STRUCTURAL DESIGN STUDIO

DESIGN CRITERIA

BUILDING CODE
Design, construction, and inspection shall conform to the International Building Code, (IBC), 2018 Edition and International Residential Code, 2018 Edition and all Local Codes that may be applicable.

Material test standards referenced shall be the edition referenced in the 2018 IBC.

RISK CATEGORY OF BUILDING: II

DESIGN LOAD CRITERIA
At all times, the General Contractor and Owner shall keep the loads on the structure within the limits of the design load criteria.

The General Contractor is responsible to provide all bracing and shoring as required to support the loads that may be imposed on the structure during construction until all structural elements are complete.

DESIGN ROOF LOADS

Live Load (Snow)	100 PSF (Balanced Snow Load)
Dead Load	20 PSF
Wood Load Duration Factor	1.15
Importance Factor Snow (Is)	1.0

Drift and Un-Balanced Loads per ASCE/SEI 7-16

Ground Snow Load	120 PSF
Exposure Factor (Ce)	1.0
Temperature Factor (Ct)	1.1

DESIGN FLOOR LOADS

Live Load	40 PSF
Dead Load	20 PSF

DESIGN DECK LOADS

Live Load	40 PSF
Dead Load	35 PSF

WIND LOAD DATA

Wind Speed (3 sec. gust)	103 MPH
Importance Factor (Iw)	1.0
Building Category	I
Exposure Category	B
Internal Pressure Coefficient	+/- 0.18

SEISMIC LOAD DATA

Project Coordinates	(43.69, -114.4)
Importance Factor (Is)	1.0
Ss	0.631
S1	0.194
Sds	0.545
Sd1	0.287
Site Class	D
Seismic Design Category	D

Basic Seismic Force Resisting System - Light Frame Walls with Wood Structural Panels
Response Modification Coefficient (R) = 6.5
Equivalent Force Analysis Procedure
E = 1.0

Vbase (unmodified)	0.094*W
Seismic Weights (W)	Dead Loads + 35% Balanced Snow Load

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

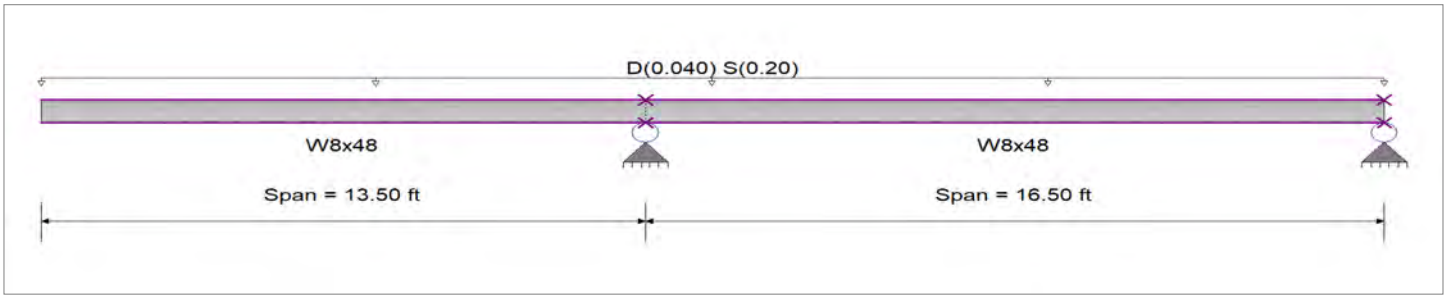
DESCRIPTION: B4-1 Cantilevered Steel Roof Joist

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.215 : 1	Maximum Shear Stress Ratio =	0.058 : 1
Section used for this span	W8x48	Section used for this span	W8x48
Ma : Applied	26.244 k-ft	Va : Applied	3.967 k
Mn / Omega : Allowable	122.255 k-ft	Vn/Omega : Allowable	68.0 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	13.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.544 in	Ratio =	595	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.046 in	Ratio =	4,344	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.784 in	Ratio =	413	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.066 in	Ratio =	3017	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 13.50 ft	1	0.066	0.018		-8.02	8.02	204.17	122.26	1.00	1.00	1.21	102.00 68.00
Dsgn. L = 16.50 ft	2	0.066	0.018	0.33	-8.02	8.02	204.17	122.26	1.00	1.00	1.21	102.00 68.00
+D+S												
Dsgn. L = 13.50 ft	1	0.215	0.058		-26.24	26.24	204.17	122.26	1.00	1.00	3.97	102.00 68.00
Dsgn. L = 16.50 ft	2	0.215	0.058	1.07	-26.24	26.24	204.17	122.26	1.00	1.00	3.97	102.00 68.00
+D+0.750S												
Dsgn. L = 13.50 ft	1	0.177	0.048		-21.69	21.69	204.17	122.26	1.00	1.00	3.28	102.00 68.00
Dsgn. L = 16.50 ft	2	0.177	0.048	0.89	-21.69	21.69	204.17	122.26	1.00	1.00	3.28	102.00 68.00
+0.60D												
Dsgn. L = 13.50 ft	1	0.039	0.011		-4.81	4.81	204.17	122.26	1.00	1.00	0.73	102.00 68.00
Dsgn. L = 16.50 ft	2	0.039	0.011	0.20	-4.81	4.81	204.17	122.26	1.00	1.00	0.73	102.00 68.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.7836	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0656	5.346

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		7.854	0.785

Steel Beam

DESCRIPTION: B4-1 Cantilevered Steel Roof Joist

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from Load Combinations		7.854	0.785
Max Upward from Load Cases		5.455	0.545
D Only		2.400	0.240
+D+S		7.854	0.785
+D+0.750S		6.491	0.649
+0.60D		1.440	0.144
S Only		5.455	0.545

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

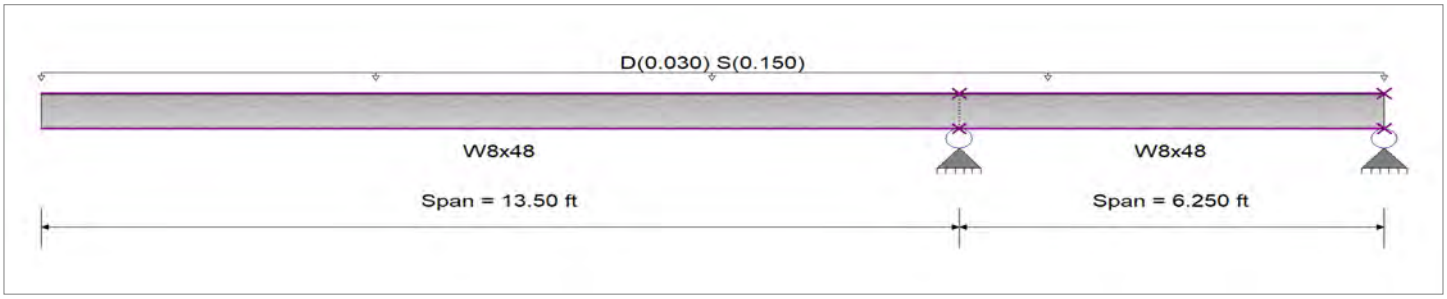
DESCRIPTION: B4-2

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.170 : 1	Maximum Shear Stress Ratio =	0.059 : 1
Section used for this span	W8x48	Section used for this span	W8x48
Ma : Applied	20.776 k-ft	Va : Applied	4.037 k
Mn / Omega : Allowable	122.255 k-ft	Vn/Omega : Allowable	68.0 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	13.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.320 in	Ratio =	1,012	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.010 in	Ratio =	7,305	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.486 in	Ratio =	666	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.016 in	Ratio =	4806	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 13.50 ft	1	0.058	0.020		-7.11	7.11	204.17	122.26	1.00	1.00	1.38	102.00 68.00
Dsgn. L = 6.25 ft	2	0.058	0.020		-7.11	7.11	204.17	122.26	1.00	1.00	1.38	102.00 68.00
+D+S												
Dsgn. L = 13.50 ft	1	0.170	0.059		-20.78	20.78	204.17	122.26	1.00	1.00	4.04	102.00 68.00
Dsgn. L = 6.25 ft	2	0.170	0.059		-20.78	20.78	204.17	122.26	1.00	1.00	4.04	102.00 68.00
+D+0.750S												
Dsgn. L = 13.50 ft	1	0.142	0.050		-17.36	17.36	204.17	122.26	1.00	1.00	3.37	102.00 68.00
Dsgn. L = 6.25 ft	2	0.142	0.050		-17.36	17.36	204.17	122.26	1.00	1.00	3.37	102.00 68.00
+0.60D												
Dsgn. L = 13.50 ft	1	0.035	0.012		-4.26	4.26	204.17	122.26	1.00	1.00	0.83	102.00 68.00
Dsgn. L = 6.25 ft	2	0.035	0.012		-4.26	4.26	204.17	122.26	1.00	1.00	0.83	102.00 68.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.4865	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0156	2.600

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		7.115	

Steel Beam

DESCRIPTION: B4-2

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from Load Combinations		7.115	
Max Upward from Load Cases		4.681	
Max Downward from all Load Conditions (Resis			-2.612
Max Downward from Load Combinations (Resi			-2.612
Max Downward from Load Cases (Resisting Up			-1.718
D Only		2.434	-0.893
+D+S		7.115	-2.612
+D+0.750S		5.944	-2.182
+0.60D		1.460	-0.536
S Only		4.681	-1.718

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

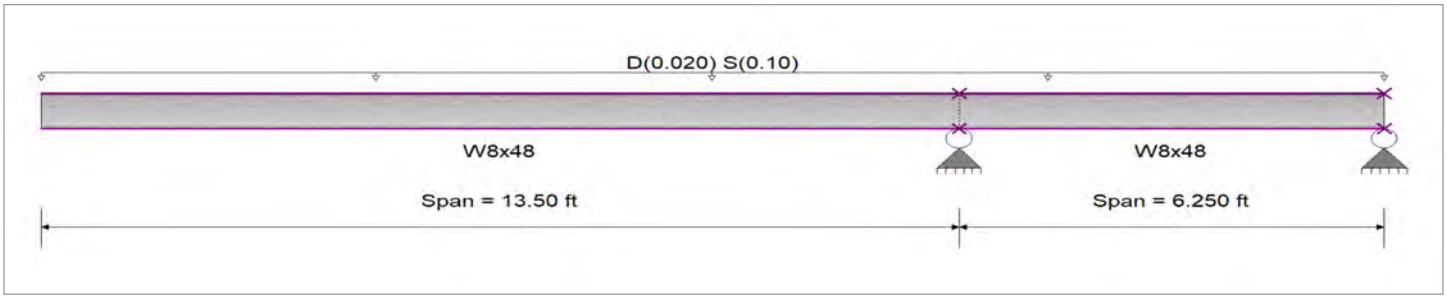
DESCRIPTION: B4-3

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.125 : 1	Maximum Shear Stress Ratio =	0.044 : 1
Section used for this span	W8x48	Section used for this span	W8x48
Ma : Applied	15.309 k-ft	Va : Applied	2.974 k
Mn / Omega : Allowable	122.255 k-ft	Vn/Omega : Allowable	68.0 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	13.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.213 in	Ratio =	1,518	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.007 in	Ratio =	10,957	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.358 in	Ratio =	904	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.011 in	Ratio =	6523	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 13.50 ft	1	0.051	0.018		-6.20	6.20	204.17	122.26	1.00	1.00	1.20	102.00 68.00
Dsgn. L = 6.25 ft	2	0.051	0.018		-6.20	6.20	204.17	122.26	1.00	1.00	1.20	102.00 68.00
+D+S												
Dsgn. L = 13.50 ft	1	0.125	0.044		-15.31	15.31	204.17	122.26	1.00	1.00	2.97	102.00 68.00
Dsgn. L = 6.25 ft	2	0.125	0.044		-15.31	15.31	204.17	122.26	1.00	1.00	2.97	102.00 68.00
+D+0.750S												
Dsgn. L = 13.50 ft	1	0.107	0.037		-13.03	13.03	204.17	122.26	1.00	1.00	2.53	102.00 68.00
Dsgn. L = 6.25 ft	2	0.107	0.037		-13.03	13.03	204.17	122.26	1.00	1.00	2.53	102.00 68.00
+0.60D												
Dsgn. L = 13.50 ft	1	0.030	0.011		-3.72	3.72	204.17	122.26	1.00	1.00	0.72	102.00 68.00
Dsgn. L = 6.25 ft	2	0.030	0.011		-3.72	3.72	204.17	122.26	1.00	1.00	0.72	102.00 68.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3584	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0115	2.600

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		5.242	

Steel Beam

DESCRIPTION: B4-3

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from Load Combinations		5.242	
Max Upward from Load Cases		3.121	
Max Downward from all Load Conditions (Resis			-1.924
Max Downward from Load Combinations (Resi			-1.924
Max Downward from Load Cases (Resisting Up			-1.146
D Only		2.122	-0.779
+D+S		5.242	-1.924
+D+0.750S		4.462	-1.638
+0.60D		1.273	-0.467
S Only		3.121	-1.146

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-4

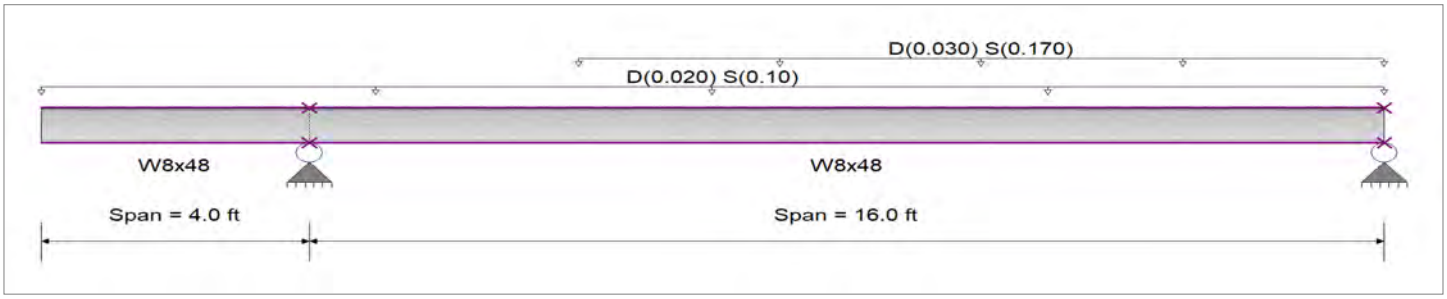
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

Partial Length Uniform Load : D = 0.030, S = 0.170 k/ft, Extent = 8.0 -->> 20.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.074** : 1	Maximum Shear Stress Ratio =	**0.035** : 1
Section used for this span	**W8x48**	Section used for this span	**W8x48**
Ma : Applied	9.000 k-ft	Va : Applied	2.40 k
Mn / Omega : Allowable	122.255 k-ft	Vn/Omega : Allowable	68.0 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	16.000 ft
Span # where maximum occurs	Span # 2	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.064 in	Ratio =	2,994	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.046 in	Ratio =	2,090	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.076 in	Ratio =	2526	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.054 in	Ratio =	1765	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 4.00 ft	1	0.001	0.004		-0.16	0.16	204.17	122.26	1.00	1.00	0.31	102.00 68.00
Dsgn. L = 16.00 ft	2	0.012	0.006	1.41	-0.16	1.41	204.17	122.26	1.00	1.00	0.38	102.00 68.00
+D+S												
Dsgn. L = 4.00 ft	1	0.008	0.028		-0.96	0.96	204.17	122.26	1.00	1.00	1.92	102.00 68.00
Dsgn. L = 16.00 ft	2	0.074	0.035	9.00	-0.96	9.00	204.17	122.26	1.00	1.00	2.40	102.00 68.00
+D+0.750S												
Dsgn. L = 4.00 ft	1	0.006	0.022		-0.76	0.76	204.17	122.26	1.00	1.00	1.52	102.00 68.00
Dsgn. L = 16.00 ft	2	0.058	0.028	7.10	-0.76	7.10	204.17	122.26	1.00	1.00	1.89	102.00 68.00
+0.60D												
Dsgn. L = 4.00 ft	1	0.001	0.003		-0.10	0.10	204.17	122.26	1.00	1.00	0.18	102.00 68.00
Dsgn. L = 16.00 ft	2	0.007	0.003	0.84	-0.10	0.84	204.17	122.26	1.00	1.00	0.23	102.00 68.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0544	0.000
+D+S	2	0.0760	8.192		0.0000	0.000

Steel Beam

DESCRIPTION: B4-4

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		2.400	2.400
Max Upward from Load Combinations		2.400	2.400
Max Upward from Load Cases		2.015	2.025
D Only		0.385	0.375
+D+S		2.400	2.400
+D+0.750S		1.896	1.894
+0.60D		0.231	0.225
S Only		2.015	2.025

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

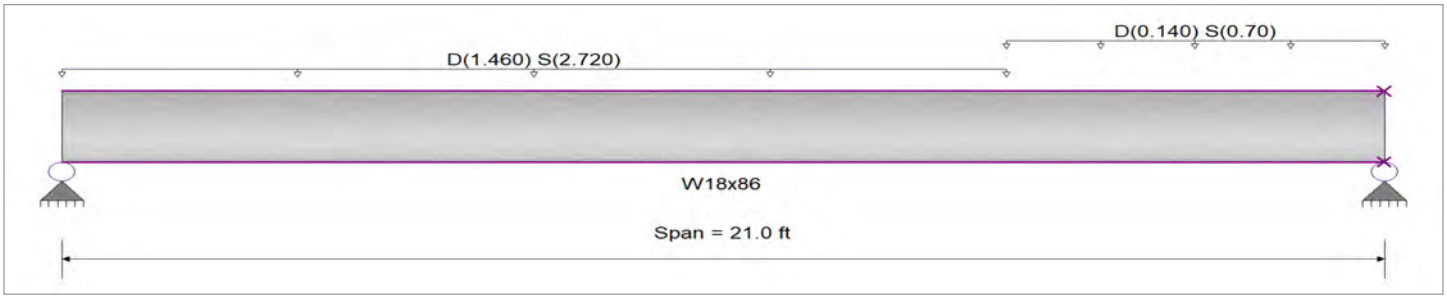
DESCRIPTION: B4-5

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Partial Length Uniform Load : D = 1.460, S = 2.720 k/ft, Extent = 0.0 -->> 15.0 ft

Partial Length Uniform Load : D = 0.140, S = 0.70 k/ft, Extent = 15.0 -->> 21.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.434 : 1	Maximum Shear Stress Ratio =	0.232 : 1
Section used for this span	W18x86	Section used for this span	W18x86
Ma : Applied	201.342 k-ft	Va : Applied	41.027 k
Mn / Omega : Allowable	464.072 k-ft	Vn/Omega : Allowable	176.640 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.232 in	Ratio =	1,083	>=360
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360
Max Downward Total Deflection	0.353 in	Ratio =	714	>=180
Max Upward Total Deflection	0.000 in	Ratio =	0	<180

Span: 1 : S Only
Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 21.00 ft	1	0.149	0.080	69.04		69.04	775.00	464.07	1.00	1.00	14.20	264.96 176.64
+D+S												
Dsgn. L = 21.00 ft	1	0.434	0.232	201.34		201.34	775.00	464.07	1.00	1.00	41.03	264.96 176.64
+D+0.750S												
Dsgn. L = 21.00 ft	1	0.363	0.194	168.26		168.26	775.00	464.07	1.00	1.00	34.32	264.96 176.64
+0.60D												
Dsgn. L = 21.00 ft	1	0.089	0.048	41.42		41.42	775.00	464.07	1.00	1.00	8.52	264.96 176.64

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3531	10.320		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	41.027	26.713	2.025
Max Upward from Load Combinations	41.027	26.713	2.025
Max Upward from Load Cases	26.829	18.171	2.025
Max Downward from all Load Conditions (Resis			2.025

Steel Beam

DESCRIPTION: B4-5

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Downward from Load Combinations (Resi			2.025
Max Downward from Load Cases (Resisting Up			2.025
D Only	14.199	8.541	2.025
+D+S	41.027	26.713	2.025
+D+0.750S	34.320	22.170	2.025
+0.60D	8.519	5.125	2.025
S Only	26.829	18.171	2.025

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

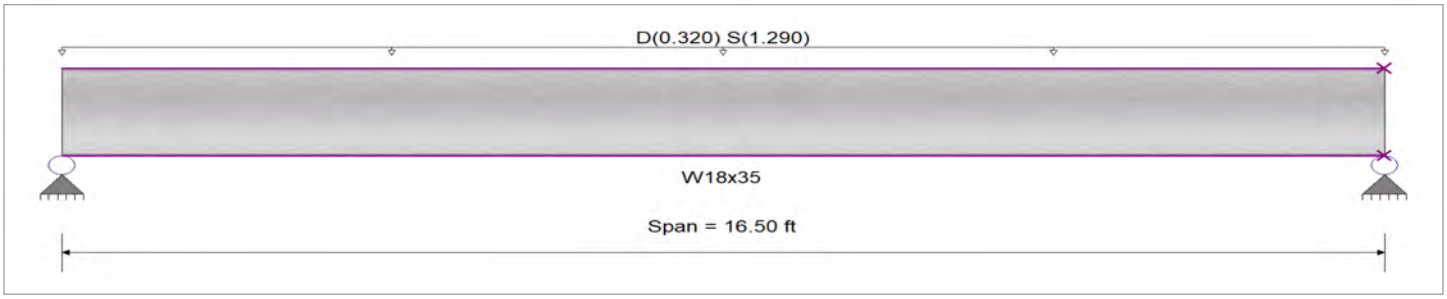
DESCRIPTION: B4-6

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.320, S = 1.290 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.337 : 1	Maximum Shear Stress Ratio =	0.128 : 1
Section used for this span	W18x35	Section used for this span	W18x35
Ma : Applied	55.983 k-ft	Va : Applied	13.572 k
Mn / Omega : Allowable	165.918 k-ft	Vn/Omega : Allowable	106.20 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.146 in	Ratio =	1,355	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.186 in	Ratio =	1063	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 16.50 ft	1	0.073	0.028	12.08		12.08	277.08	165.92	1.00	1.00	2.93	159.30	106.20
+D+S													
Dsgn. L = 16.50 ft	1	0.337	0.128	55.98		55.98	277.08	165.92	1.00	1.00	13.57	159.30	106.20
+D+0.750S													
Dsgn. L = 16.50 ft	1	0.271	0.103	45.01		45.01	277.08	165.92	1.00	1.00	10.91	159.30	106.20
+0.60D													
Dsgn. L = 16.50 ft	1	0.044	0.017	7.25		7.25	277.08	165.92	1.00	1.00	1.76	159.30	106.20

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1863	8.297		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	13.572	13.572	2.025
Max Upward from Load Combinations	13.572	13.572	2.025
Max Upward from Load Cases	10.643	10.643	2.025
Max Downward from all Load Conditions (Resis			2.025
Max Downward from Load Combinations (Resi			2.025
Max Downward from Load Cases (Resisting Up			2.025

Steel Beam

DESCRIPTION: B4-6

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
D Only	2.929	2.929	2.025
+D+S	13.572	13.572	2.025
+D+0.750S	10.911	10.911	2.025
+0.60D	1.758	1.758	2.025
S Only	10.643	10.643	2.025

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-7

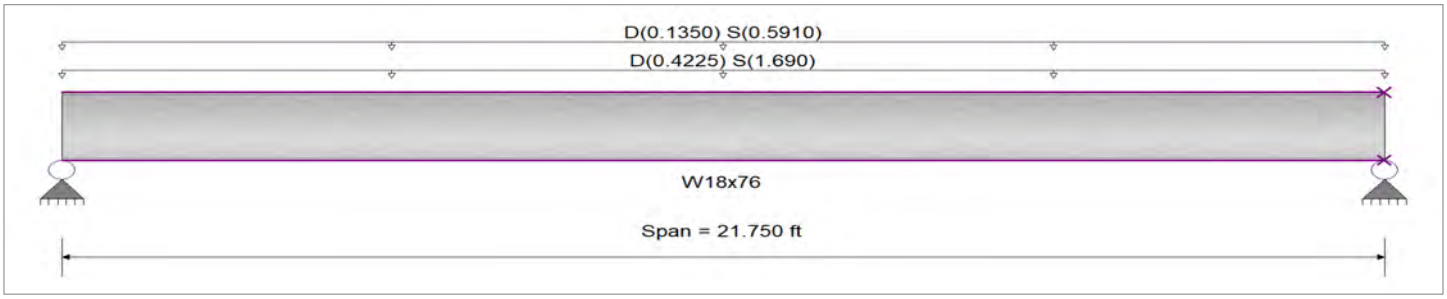
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, S = 0.10 ksf, Tributary Width = 16.90 ft

Uniform Load on ALL spans : D = 0.1350, S = 0.5910 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.424 : 1	Maximum Shear Stress Ratio =	0.205 : 1
Section used for this span	W18x76	Section used for this span	W18x76
Ma : Applied	172.337 k-ft	Va : Applied	31.694 k
Mn / Omega : Allowable	406.687 k-ft	Vn/Omega : Allowable	154.70 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.299 in	Ratio =	872	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.382 in	Ratio =	683	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 21.75 ft	1	0.092	0.045	37.46		37.46	679.17	406.69	1.00	1.00	6.89	232.05 154.70
+D+S												
Dsgn. L = 21.75 ft	1	0.424	0.205	172.34		172.34	679.17	406.69	1.00	1.00	31.69	232.05 154.70
+D+0.750S												
Dsgn. L = 21.75 ft	1	0.341	0.165	138.62		138.62	679.17	406.69	1.00	1.00	25.49	232.05 154.70
+0.60D												
Dsgn. L = 21.75 ft	1	0.055	0.027	22.47		22.47	679.17	406.69	1.00	1.00	4.13	232.05 154.70

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3822	10.937		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	31.694	31.694	2.025
Max Upward from Load Combinations	31.694	31.694	2.025
Max Upward from Load Cases	24.806	24.806	2.025
Max Downward from all Load Conditions (Resis			2.025

Steel Beam

DESCRIPTION: B4-7

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Downward from Load Combinations (Resi			2.025
Max Downward from Load Cases (Resisting Up			2.025
D Only	6.888	6.888	2.025
+D+S	31.694	31.694	2.025
+D+0.750S	25.493	25.493	2.025
+0.60D	4.133	4.133	2.025
S Only	24.806	24.806	2.025

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-8

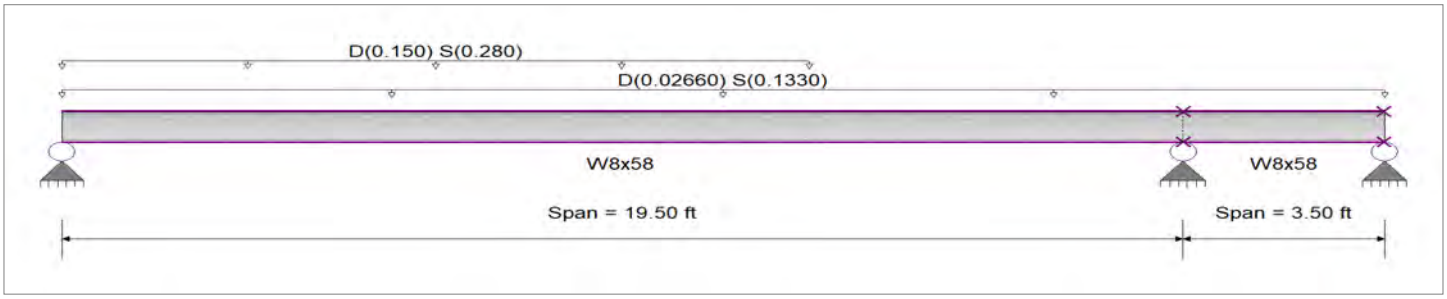
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft

Partial Length Uniform Load : D = 0.150, S = 0.280 k/ft, Extent = 0.0 -->> 13.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.124 : 1	Maximum Shear Stress Ratio =	0.062 : 1
Section used for this span	W8x58	Section used for this span	W8x58
Ma : Applied	18.449 k-ft	Va : Applied	5.550 k
Mn / Omega : Allowable	149.202 k-ft	Vn/Omega : Allowable	89.250 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	19.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.091 in	Ratio =	2,584	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.003 in	Ratio =	15,724	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.128 in	Ratio =	1828	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.004 in	Ratio =	11204	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 19.50 ft	1	0.035	0.017	4.71	-5.26	5.26	249.17	149.20	1.00	1.00	1.55	133.88 89.25
Dsgn. L = 3.50 ft	2	0.035	0.017		-5.26	5.26	249.17	149.20	1.00	1.00	1.55	133.88 89.25
+D+S												
Dsgn. L = 19.50 ft	1	0.124	0.062	15.95	-18.45	18.45	249.17	149.20	1.00	1.00	5.55	133.88 89.25
Dsgn. L = 3.50 ft	2	0.124	0.062		-18.45	18.45	249.17	149.20	1.00	1.00	5.55	133.88 89.25
+D+0.750S												
Dsgn. L = 19.50 ft	1	0.102	0.051	13.14	-15.15	15.15	249.17	149.20	1.00	1.00	4.55	133.88 89.25
Dsgn. L = 3.50 ft	2	0.102	0.051		-15.15	15.15	249.17	149.20	1.00	1.00	4.55	133.88 89.25
+0.60D												
Dsgn. L = 19.50 ft	1	0.021	0.010	2.83	-3.15	3.15	249.17	149.20	1.00	1.00	0.93	133.88 89.25
Dsgn. L = 3.50 ft	2	0.021	0.010		-3.15	3.15	249.17	149.20	1.00	1.00	0.93	133.88 89.25

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1280	8.424		0.0000	0.000
	2	0.0000	8.424	+D+S	-0.0037	1.484

Steel Beam

DESCRIPTION: B4-8

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	4.337	9.916	
Max Upward from Load Combinations	4.337	9.916	
Max Upward from Load Cases	3.047	7.188	
Max Downward from all Load Conditions (Resis			-4.992
Max Downward from Load Combinations (Resi			-4.992
Max Downward from Load Cases (Resisting Up			-3.536
D Only	1.290	2.728	-1.456
+D+S	4.337	9.916	-4.992
+D+0.750S	3.575	8.119	-4.108
+0.60D	0.774	1.637	-0.873
S Only	3.047	7.188	-3.536

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-9 - Grid K Strucutral Fascia

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

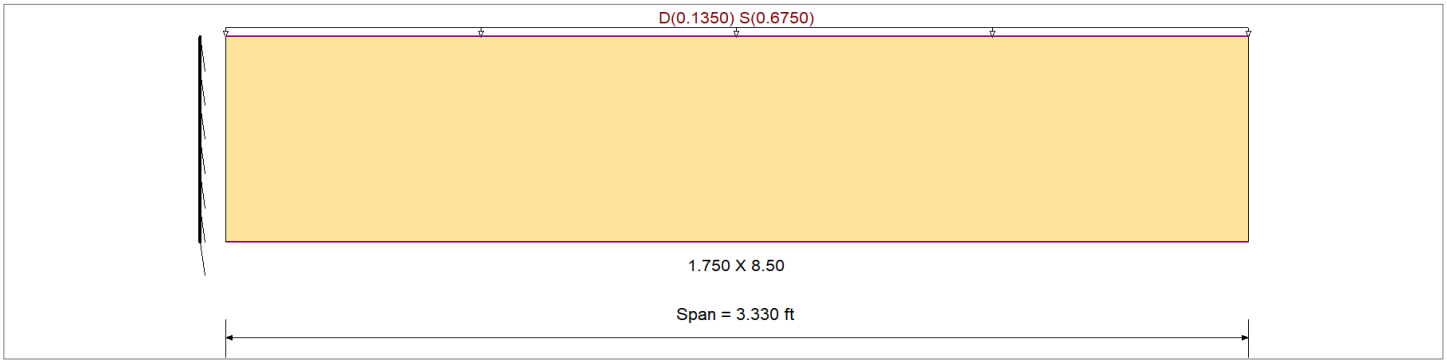
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 6.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.751 : 1	Maximum Shear Stress Ratio	=	0.654 : 1
Section used for this span		1.750 X 8.50	Section used for this span		1.750 X 8.50
fb: Actual	=	2,557.41 psi	fv: Actual	=	214.42 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	0.000 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.100 in	Ratio =	800 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.120 in	Ratio =	666 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 3.330 ft	1	0.160	0.139	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.75	426.2	2,665.1	0.35	35.7	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.330 ft	1	0.751	0.654	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.49	2,557.4	3,405.4	2.13	214.4	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.330 ft	1	0.595	0.518	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	3.56	2,024.6	3,405.4	1.68	169.7	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.330 ft	1	0.054	0.047	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.45	255.7	4,738.0	0.21	21.4	456.0

Wood Beam

DESCRIPTION: B4-9 - Grid K Strucutral Fascia

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1198	3.330		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.697	
Max Upward from Load Combinations	2.697	
Max Upward from Load Cases	2.248	
D Only	0.450	
+D+S	2.697	
+D+0.750S	2.135	
+0.60D	0.270	
S Only	2.248	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-10

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

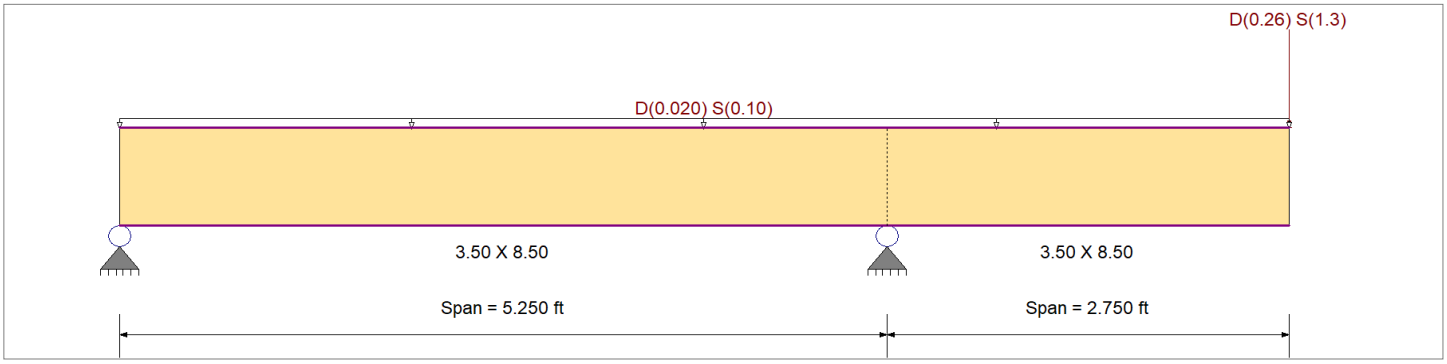
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft
Load for Span Number 2
Point Load : D = 0.260, S = 1.30 k @ 2.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.361 : 1	Maximum Shear Stress Ratio	=	0.280 : 1
Section used for this span		3.50 X 8.50	Section used for this span		3.50 X 8.50
fb: Actual	=	1,359.96 psi	fv: Actual	=	91.91 psi
F'b	=	3,770.30 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.250 ft	Location of maximum on span	=	5.250 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.130 in	Ratio =	504 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.029 in	Ratio =	2149 >=360	Span: 1 : S Only
Max Downward Total Deflection	0.157 in	Ratio =	420 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.035 in	Ratio =	1797 >=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.250 ft	1	0.079	0.063	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.82	234.4	2,950.7	0.32	16.1	256.5
Length = 2.750 ft	2	0.079	0.063	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.82	234.4	2,950.7	0.32	16.1	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.250 ft	1	0.361	0.280	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.78	1,360.0	3,770.3	1.82	91.9	327.8
Length = 2.750 ft	2	0.361	0.280	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.78	1,360.0	3,770.3	1.82	91.9	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.250 ft	1	0.286	0.223	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	3.79	1,078.6	3,770.3	1.45	72.9	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-10

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 2.750 ft	**2**	0.286	0.223	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	3.79	1,078.6	3,770.3	1.45	72.9	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.250 ft	**1**	0.027	0.021	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.49	140.6	5,245.6	0.19	9.6	456.0
Length = 2.750 ft	**2**	0.027	0.021	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.49	140.6	5,245.6	0.19	9.6	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0350	3.109
+D+S	2	0.1570	2.750		0.0000	3.109

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		3.161	
Max Upward from Load Combinations		3.161	
Max Upward from Load Cases		2.590	
Max Downward from all Load Conditio	-0.572		
Max Downward from Load Combinations	-0.572		
Max Downward from Load Cases (Resis	-0.490		
D Only	-0.082	0.571	
+D+S	-0.572	3.161	
+D+0.750S	-0.450	2.514	
+0.60D	-0.049	0.342	
S Only	-0.490	2.590	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: N/S Ladder Framing West Side

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

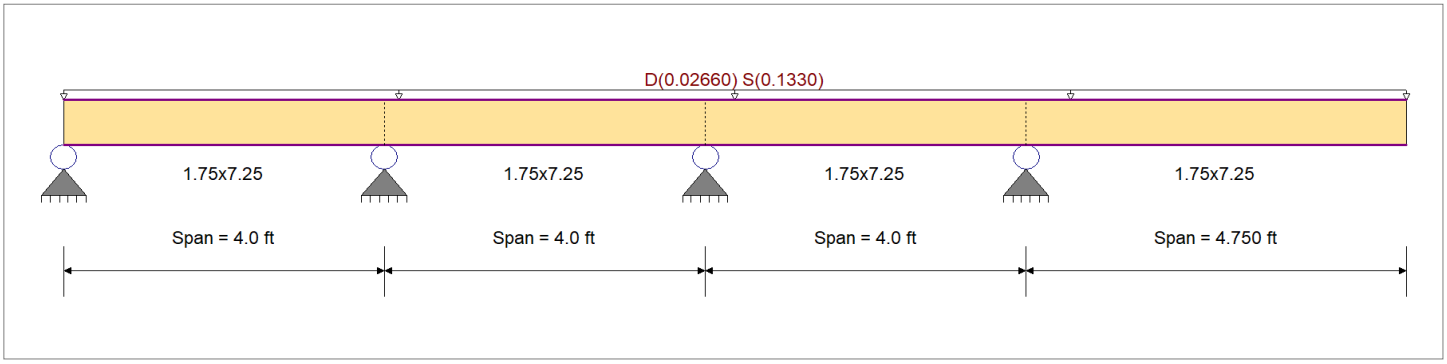
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2800 psi
Fb -	2800 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf

Repetitive Member Stress Increase



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.398 : 1	Maximum Shear Stress Ratio	=	0.266 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	1,409.32 psi	fv: Actual	=	87.09 psi
F'b	=	3,541.65 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	3.443 ft
Span # where maximum occurs	=	Span # 3	Span # where maximum occurs	=	Span # 3

Maximum Deflection

Max Downward Transient Deflection	0.243 in	Ratio =	468 >=360	Span: 4 : S Only
Max Upward Transient Deflection	-0.015 in	Ratio =	3205 >=360	Span: 3 : S Only
Max Downward Total Deflection	0.291 in	Ratio =	390 >=180	Span: 4 : +D+S
Max Upward Total Deflection	-0.018 in	Ratio =	2671 >=180	Span: 3 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 4.0 ft	1	0.018	0.029	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.06	49.0	2,771.7	0.06	7.5	256.5
Length = 4.0 ft	2	0.018	0.029	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.06	49.0	2,771.7	0.06	7.5	256.5
Length = 4.0 ft	3	0.085	0.057	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.30	234.9	2,771.7	0.12	14.5	256.5
Length = 4.750 ft	4	0.085	0.057	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.30	234.9	2,771.7	0.11	14.5	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.04			0.0	0.00	0.0	0.0
Length = 4.0 ft	1	0.083	0.137	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.38	293.8	3,541.6	0.38	45.0	327.8
Length = 4.0 ft	2	0.083	0.137	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.38	293.8	3,541.6	0.38	45.0	327.8
Length = 4.0 ft	3	0.398	0.266	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	1.80	1,409.3	3,541.6	0.74	87.1	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: N/S Ladder Framing West Side

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 4.750 ft	**4**	0.398	0.266	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	1.80	1,409.3	3,541.6	0.66	87.1	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.04			0.0	0.00	0.0	0.0
Length = 4.0 ft	**1**	0.066	0.109	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.30	232.6	3,541.6	0.30	35.6	327.8
Length = 4.0 ft	**2**	0.066	0.109	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.30	232.6	3,541.6	0.30	35.6	327.8
Length = 4.0 ft	**3**	0.315	0.210	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	1.43	1,115.7	3,541.6	0.58	68.9	327.8
Length = 4.750 ft	**4**	0.315	0.210	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.04	1.43	1,115.7	3,541.6	0.52	68.9	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.04			0.0	0.00	0.0	0.0
Length = 4.0 ft	**1**	0.006	0.010	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.04	29.4	4,927.5	0.04	4.5	456.0
Length = 4.0 ft	**2**	0.006	0.010	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.04	29.4	4,927.5	0.04	4.5	456.0
Length = 4.0 ft	**3**	0.029	0.019	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.18	140.9	4,927.5	0.07	8.7	456.0
Length = 4.750 ft	**4**	0.029	0.019	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.04	0.18	140.9	4,927.5	0.07	8.7	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0027	1.620	+D+S	-0.0001	3.797
+D+S	2	0.0063	2.380		0.0000	3.797
	3	0.0000	2.380	+D+S	-0.0180	2.582
+D+S	4	0.2913	4.750		0.0000	2.582

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4	Support 5
Max Upward from all Load Conditions	0.225	0.882		1.584	
Max Upward from Load Combinations	0.225	0.882		1.584	
Max Upward from Load Cases	0.188	0.735		1.320	
Max Downward from all Load Conditio			-0.018		
Max Downward from Load Combinations			-0.018		
Max Downward from Load Cases (Resis			-0.015		
D Only	0.038	0.147	-0.003	0.264	
+D+S	0.225	0.882	-0.018	1.584	
+D+0.750S	0.178	0.698	-0.014	1.254	
+0.60D	0.023	0.088	-0.002	0.158	
S Only	0.188	0.735	-0.015	1.320	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: NW Corner 8 1/2 LVL framing

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

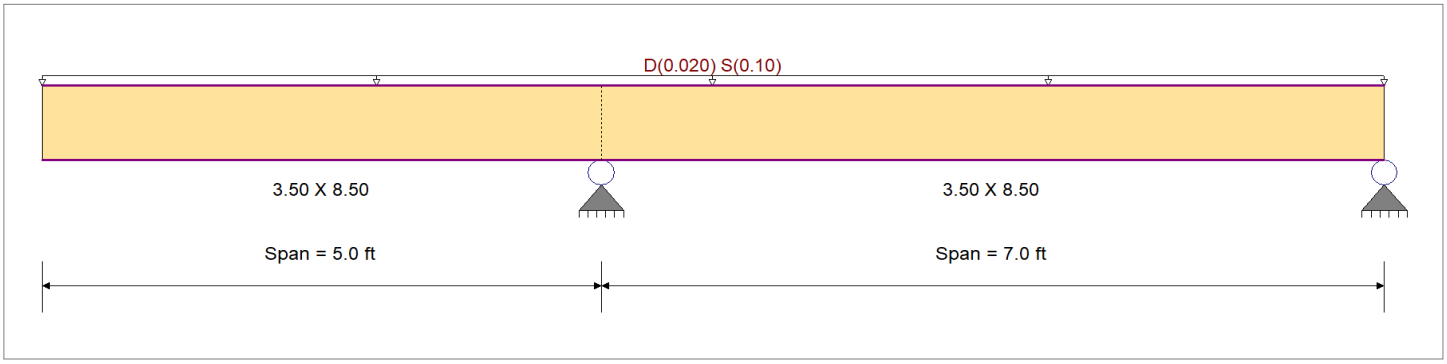
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.129 : 1	Maximum Shear Stress Ratio	=	0.085 : 1
Section used for this span		3.50 X 8.50	Section used for this span		3.50 X 8.50
fb: Actual	=	427.09 psi	fv: Actual	=	27.72 psi
F'b	=	3,304.68 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.000 ft	Location of maximum on span	=	5.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.074 in	Ratio =	1628 >=360	Span: 1 : S Only
Max Upward Transient Deflection	-0.006 in	Ratio =	15119 >=360	Span: 2 : S Only
Max Downward Total Deflection	0.088 in	Ratio =	1356 >=180	Span: 1 : +D+S
Max Upward Total Deflection	-0.007 in	Ratio =	12599 >=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.028	0.018	0.90	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.25	71.2	2,586.3	0.09	4.6	256.5
Length = 7.0 ft	2	0.028	0.018	0.90	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.25	71.2	2,586.3	0.09	4.6	256.5
+D+S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.129	0.085	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.50	427.1	3,304.7	0.55	27.7	327.8
Length = 7.0 ft	2	0.129	0.085	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.50	427.1	3,304.7	0.55	27.7	327.8
+D+0.750S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.102	0.067	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.19	338.1	3,304.7	0.44	21.9	327.8
Length = 7.0 ft	2	0.102	0.067	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.19	338.1	3,304.7	0.44	21.9	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: NW Corner 8 1/2 LVL framing

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	**1**	0.009	0.006	1.60	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.15	42.7	4,597.8	0.05	2.8	456.0
Length = 7.0 ft	**2**	0.009	0.006	1.60	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.15	42.7	4,597.8	0.05	2.8	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0884	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0067	1.799

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		1.234	0.206
Max Upward from Load Combinations		1.234	0.206
Max Upward from Load Cases		1.029	0.171
D Only		0.206	0.034
+D+S		1.234	0.206
+D+0.750S		0.977	0.163
+0.60D		0.123	0.021
S Only		1.029	0.171

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 2x8 LVL Ladder Framing West Side

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

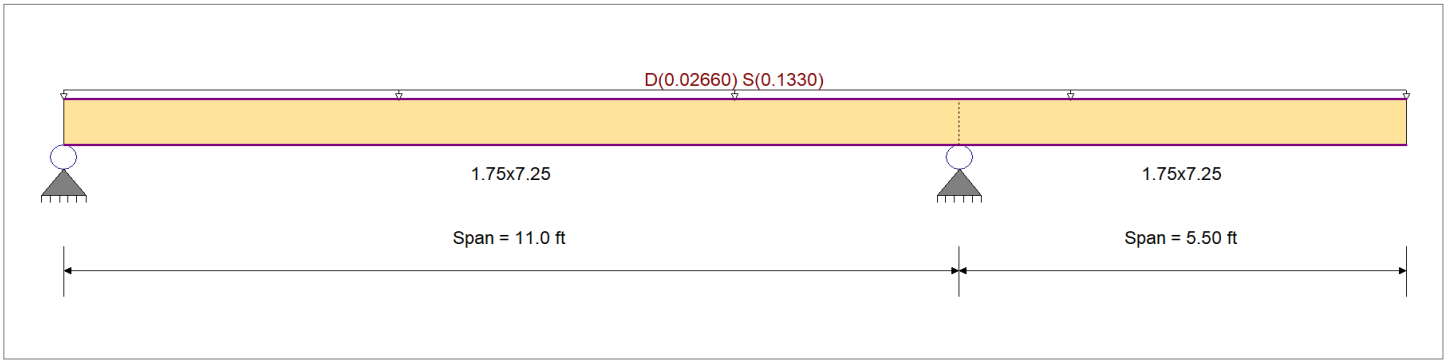
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.568 : 1	Maximum Shear Stress Ratio	=	0.372 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	1,933.06 psi	fv: Actual	=	122.04 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	11.000 ft	Location of maximum on span	=	10.447 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.236 in	Ratio =	560	>=360	Span: 2 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.289 in	Ratio =	456	>=180	Span: 2 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.135	0.088	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.46	358.5	2,665.1	0.19	22.6	256.5
Length = 5.50 ft	2	0.135	0.088	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.46	358.5	2,665.1	0.15	22.6	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.568	0.372	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.47	1,933.1	3,405.4	1.03	122.0	327.8
Length = 5.50 ft	2	0.568	0.372	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.47	1,933.1	3,405.4	0.80	122.0	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.452	0.297	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.97	1,539.4	3,405.4	0.82	97.2	327.8
Length = 5.50 ft	2	0.452	0.297	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.97	1,539.4	3,405.4	0.64	97.2	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 2x8 LVL Ladder Framing West Side

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	**1**	0.045	0.030	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.27	215.1	4,738.0	0.11	13.6	456.0
Length = 5.50 ft	**2**	0.045	0.030	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.27	215.1	4,738.0	0.09	13.6	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.2035	4.670		0.0000	0.000
+D+S	2	0.2893	5.500		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.674	2.021	
Max Upward from Load Combinations	0.674	2.021	
Max Upward from Load Cases	0.549	1.646	
D Only	0.125	0.375	
+D+S	0.674	2.021	
+D+0.750S	0.536	1.609	
+0.60D	0.075	0.225	
S Only	0.549	1.646	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

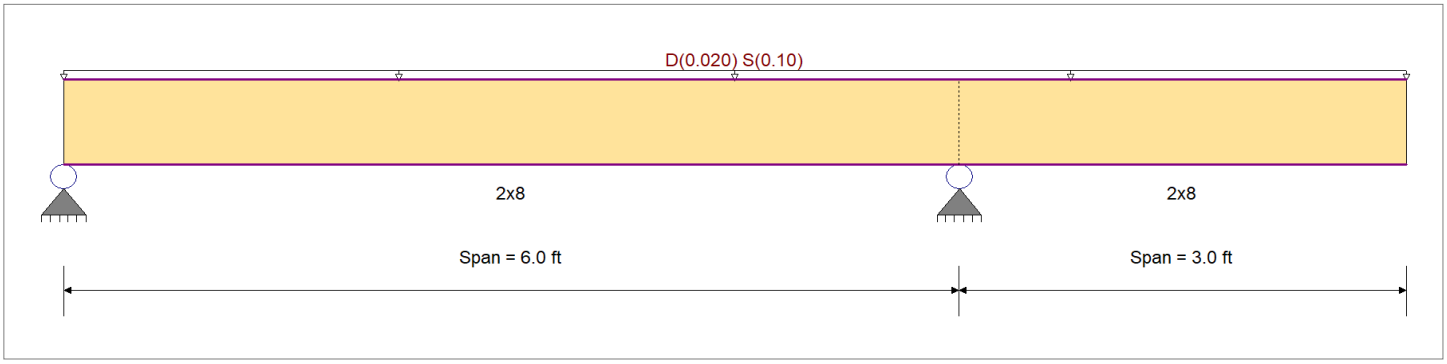
DESCRIPTION: 2x8 LVL Ladder Framing East Side

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	900.0 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	900.0 psi	Ebend- xx	1,600.0 ksi
		Fc - Prll	1,350.0 psi	Eminbend - xx	580.0 ksi
Wood Species :	Douglas Fir-Larch	Fc - Perp	625.0 psi		
Wood Grade :	No.2	Fv	180.0 psi		
		Ft	575.0 psi	Density	31.210 pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.405 : 1	Maximum Shear Stress Ratio	=	0.257 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	502.81 psi	fv: Actual	=	53.11 psi
F'b	=	1,242.00 psi	F'v	=	207.00 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	6.000 ft	Location of maximum on span	=	5.397 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.023 in	Ratio =	3148 >=360	Span: 2 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.028 in	Ratio =	2572 >=180	Span: 2 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.095	0.060	0.90	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.10	91.9	972.0	0.07	9.7	162.0
Length = 3.0 ft	2	0.095	0.060	0.90	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.10	91.9	972.0	0.05	9.7	162.0
+D+S					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.405	0.257	1.15	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.55	502.8	1,242.0	0.39	53.1	207.0
Length = 3.0 ft	2	0.405	0.257	1.15	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.55	502.8	1,242.0	0.29	53.1	207.0
+D+0.750S					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.322	0.204	1.15	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.44	400.1	1,242.0	0.31	42.3	207.0
Length = 3.0 ft	2	0.322	0.204	1.15	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.44	400.1	1,242.0	0.23	42.3	207.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 2x8 LVL Ladder Framing East Side

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.200	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	**1**	0.032	0.020	1.60	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.06	55.1	1,728.0	0.04	5.8	288.0
Length = 3.0 ft	**2**	0.032	0.020	1.60	1.00	1.00	1.00	1.200	1.00	1.00	1.00	0.06	55.1	1,728.0	0.03	5.8	288.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0197	2.547		0.0000	0.000
+D+S	2	0.0280	3.000		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.275	0.826	
Max Upward from Load Combinations	0.275	0.826	
Max Upward from Load Cases	0.225	0.675	
D Only	0.050	0.151	
+D+S	0.275	0.826	
+D+0.750S	0.219	0.657	
+0.60D	0.030	0.091	
S Only	0.225	0.675	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 2x8 LVL Ladder Framing NW/SW Corners

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

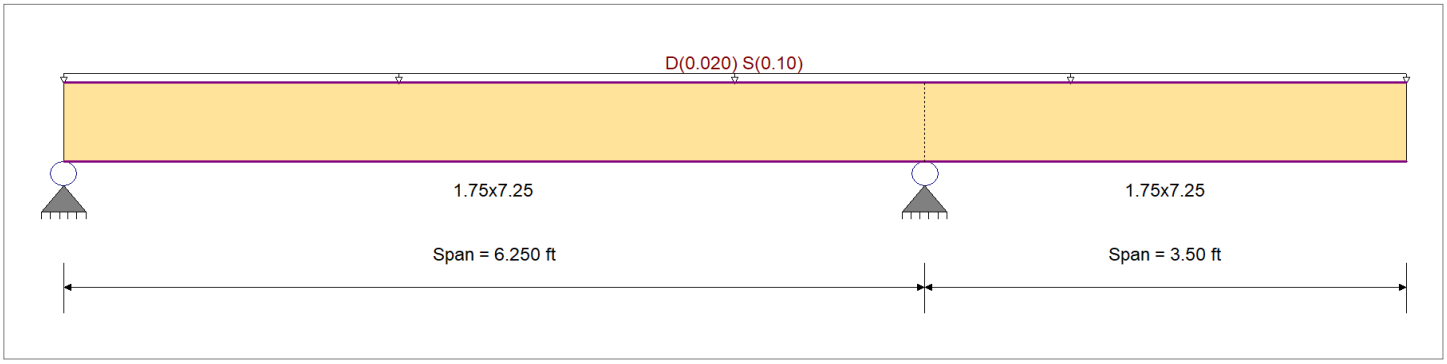
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.174 : 1	Maximum Shear Stress Ratio	=	0.157 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	592.96 psi	fv: Actual	=	51.34 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	6.250 ft	Location of maximum on span	=	5.656 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.043 in	Ratio =	1946	>=360	Span: 2 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.053 in	Ratio =	1574	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.001 in	Ratio =	71754	>=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.043	0.038	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.15	113.5	2,665.1	0.08	9.8	256.5
Length = 3.50 ft	2	0.043	0.038	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.15	113.5	2,665.1	0.07	9.8	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.174	0.157	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.76	593.0	3,405.4	0.43	51.3	327.8
Length = 3.50 ft	2	0.174	0.157	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.76	593.0	3,405.4	0.36	51.3	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.139	0.125	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.60	473.1	3,405.4	0.35	41.0	327.8
Length = 3.50 ft	2	0.139	0.125	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.60	473.1	3,405.4	0.29	41.0	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 2x8 LVL Ladder Framing NW/SW Corners

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	**1**	0.014	0.013	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.09	68.1	4,738.0	0.05	5.9	456.0
Length = 3.50 ft	**2**	0.014	0.013	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.09	68.1	4,738.0	0.04	5.9	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0108	2.374	+D+S	-0.0010	5.761
+D+S	2	0.0533	3.500		0.0000	5.761

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.265	0.941	
Max Upward from Load Combinations	0.265	0.941	
Max Upward from Load Cases	0.215	0.761	
D Only	0.051	0.180	
+D+S	0.265	0.941	
+D+0.750S	0.212	0.750	
+0.60D	0.030	0.108	
S Only	0.215	0.761	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Nothwest Corner Long Span 2x8

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

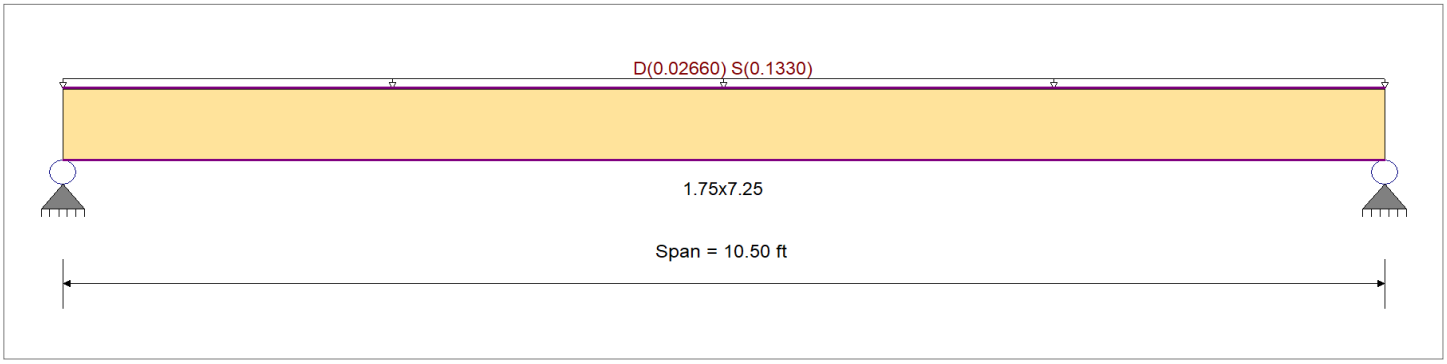
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.506 : 1	Maximum Shear Stress Ratio	=	0.269 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	1,721.63 psi	fv: Actual	=	88.22 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.250 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.329 in	Ratio =	382	>=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.395 in	Ratio =	318	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.108	0.057	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.37	286.9	2,665.1	0.12	14.7	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.506	0.269	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.20	1,721.6	3,405.4	0.75	88.2	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.400	0.213	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.74	1,363.0	3,405.4	0.59	69.8	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.036	0.019	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.22	172.2	4,738.0	0.07	8.8	456.0

Wood Beam

DESCRIPTION: Nothwest Corner Long Span 2x8

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3950	5.288		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.838	0.838
Max Upward from Load Combinations	0.838	0.838
Max Upward from Load Cases	0.698	0.698
D Only	0.140	0.140
+D+S	0.838	0.838
+D+0.750S	0.663	0.663
+0.60D	0.084	0.084
S Only	0.698	0.698

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

LIC# : KW-06016764, Build:20.22.12.28 Maxwell Structural Design Studio PLLC (c) ENERCALC INC 1983-2022

DESCRIPTION: B4-20

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

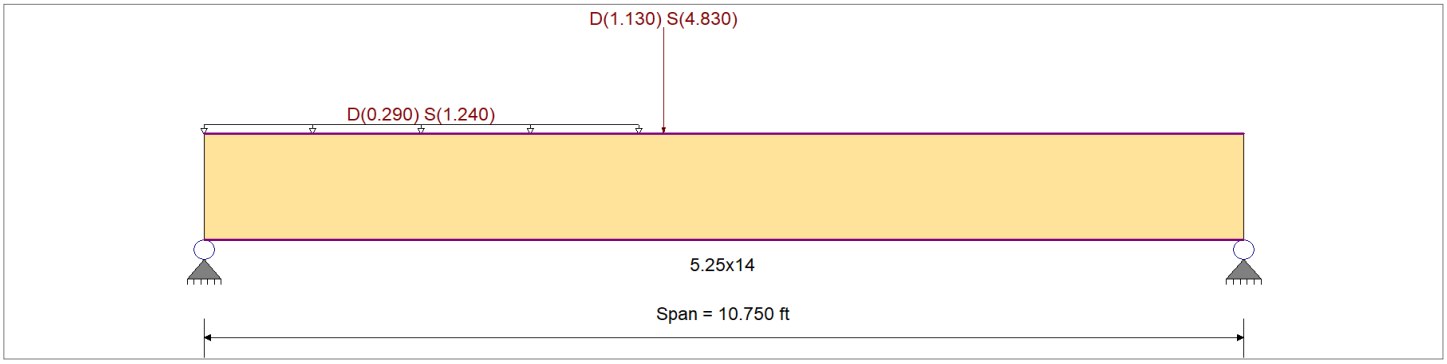
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Partial Length Uniform Load : D = 0.290, S = 1.240 k/ft, Extent = 0.0 -->> 4.50 ft
Point Load : D = 1.130, S = 4.830 k, Starting at : 4.750 ft and placed every 0.0 ft thereafter

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.494 : 1	Maximum Shear Stress Ratio	=	0.443 : 1
Section used for this span		5.25x14	Section used for this span		5.25x14
fb: Actual	=	1,731.48 psi	fv: Actual	=	145.31 psi
F'b	=	3,504.46 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.747 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.147 in	Ratio =	874 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.185 in	Ratio =	698 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 10.750 ft	1	0.126	0.113	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.94	345.5	2,742.6	1.42	29.0	256.5
+D+S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.750 ft	1	0.494	0.443	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	24.75	1,731.5	3,504.5	7.12	145.3	327.8
+D+0.750S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.750 ft	1	0.395	0.355	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.79	1,385.0	3,504.5	5.70	116.2	327.8
+0.60D					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.750 ft	1	0.043	0.038	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.96	207.3	4,875.8	0.85	17.4	456.0

Wood Beam

DESCRIPTION: B4-20

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1846	5.061		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	8.885	4.189
Max Upward from Load Combinations	8.885	4.189
Max Upward from Load Cases	7.108	3.302
D Only	1.777	0.887
+D+S	8.885	4.189
+D+0.750S	7.108	3.364
+0.60D	1.066	0.532
S Only	7.108	3.302

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-21

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

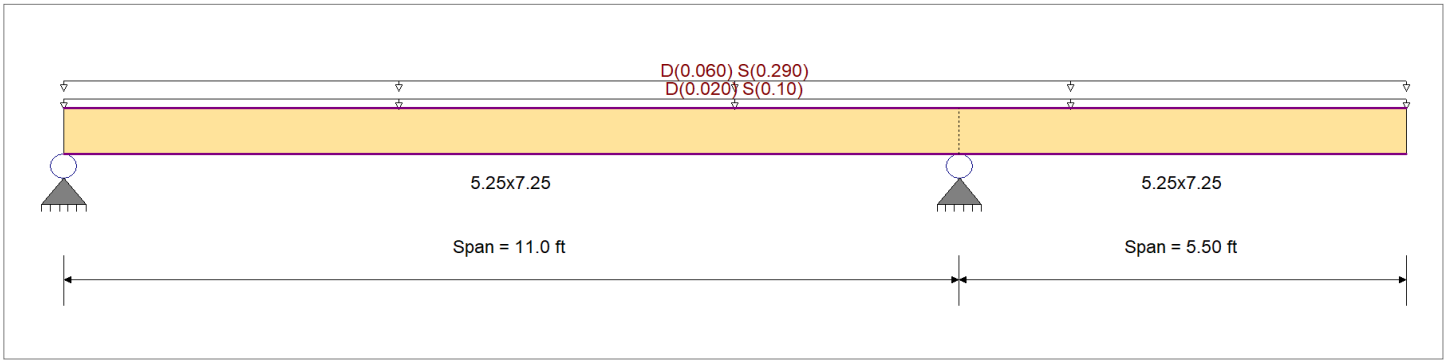
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft
Uniform Load on ALL spans : D = 0.060, S = 0.290 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.557 : 1	Maximum Shear Stress Ratio	=	0.366 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	1,898.33 psi	fv: Actual	=	119.85 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	11.000 ft	Location of maximum on span	=	10.447 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.230 in	Ratio =	572 >=360	Span: 2 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.284 in	Ratio =	464 >=180	Span: 2 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.135	0.088	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.38	359.3	2,665.1	0.58	22.7	256.5
Length = 5.50 ft	2	0.135	0.088	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.38	359.3	2,665.1	0.45	22.7	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.557	0.366	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	7.28	1,898.3	3,405.4	3.04	119.8	327.8
Length = 5.50 ft	2	0.557	0.366	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	7.28	1,898.3	3,405.4	2.36	119.8	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.444	0.292	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.80	1,513.6	3,405.4	2.42	95.6	327.8
Length = 5.50 ft	2	0.444	0.292	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.80	1,513.6	3,405.4	1.89	95.6	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-21

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	**1**	0.045	0.030	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.83	215.6	4,738.0	0.35	13.6	456.0
Length = 5.50 ft	**2**	0.045	0.030	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.83	215.6	4,738.0	0.27	13.6	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1998	4.670		0.0000	0.000
+D+S	2	0.2841	5.500		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	1.984	5.953	
Max Upward from Load Combinations	1.984	5.953	
Max Upward from Load Cases	1.609	4.826	
D Only	0.376	1.127	
+D+S	1.984	5.953	
+D+0.750S	1.582	4.746	
+0.60D	0.225	0.676	
S Only	1.609	4.826	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

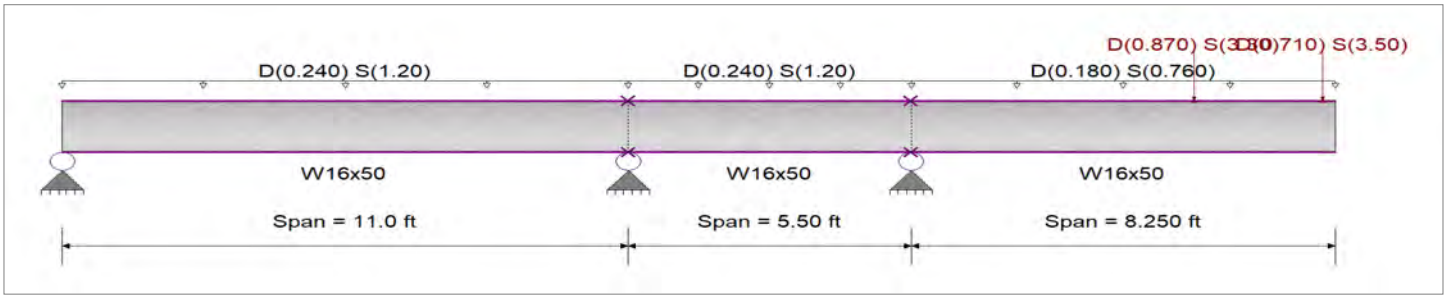
DESCRIPTION: B4-22

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load : D = 0.020, S = 0.10 ksf, Tributary Width = 12.0 ft

Load for Span Number 2
Uniform Load : D = 0.020, S = 0.10 ksf, Tributary Width = 12.0 ft

Load for Span Number 3
Uniform Load : D = 0.180, S = 0.760 k/ft, Tributary Width = 1.0 ft

Point Load : D = 0.870, S = 3.30 k @ 5.50 ft

Point Load : D = 0.710, S = 3.50 k @ 8.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.393** : 1	Maximum Shear Stress Ratio =	**0.163** : 1
Section used for this span	**W16x50**	Section used for this span	**W16x50**
Ma : Applied	90.307 k-ft	Va : Applied	20.180 k
Mn / Omega : Allowable	229.541 k-ft	Vn/Omega : Allowable	123.880 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	5.500 ft
Span # where maximum occurs	Span # 2	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.218 in	Ratio =	907	>=360	Span: 3 : S Only
Max Upward Transient Deflection	-0.012 in	Ratio =	5,623	>=360	Span: 3 : S Only
Max Downward Total Deflection	0.273 in	Ratio =	726	>=180	Span: 3 : +D+S
Max Upward Total Deflection	-0.015 in	Ratio =	4488	>=180	Span: 3 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 11.00 ft	1	0.019	0.020	4.27	-0.24	4.27	383.33	229.54	1.00	1.00	2.48	185.82 123.88
Dsgn. L = 5.50 ft	2	0.080	0.033	-0.00	-18.29	18.29	383.33	229.54	1.00	1.00	4.08	185.82 123.88
Dsgn. L = 8.25 ft	3	0.080	0.028		-18.29	18.29	383.33	229.54	1.00	1.00	3.48	185.82 123.88
+D+S												
Dsgn. L = 11.00 ft	1	0.094	0.097	21.62	-1.85	21.62	383.33	229.54	1.00	1.00	11.99	185.82 123.88
Dsgn. L = 5.50 ft	2	0.393	0.163	-0.00	-90.31	90.31	383.33	229.54	1.00	1.00	20.18	185.82 123.88
Dsgn. L = 8.25 ft	3	0.393	0.134		-90.31	90.31	383.33	229.54	1.00	1.00	16.55	185.82 123.88
+D+0.750S												

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-22

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
Dsgn. L = 11.00 ft	1	0.075	0.078	17.28	-1.45	17.28	383.33	229.54	1.00	1.00	9.61	185.82	123.88
Dsgn. L = 5.50 ft	2	0.315	0.130	-0.00	-72.30	72.30	383.33	229.54	1.00	1.00	16.16	185.82	123.88
Dsgn. L = 8.25 ft	3	0.315	0.107		-72.30	72.30	383.33	229.54	1.00	1.00	13.28	185.82	123.88
+0.60D													
Dsgn. L = 11.00 ft	1	0.011	0.012	2.56	-0.14	2.56	383.33	229.54	1.00	1.00	1.49	185.82	123.88
Dsgn. L = 5.50 ft	2	0.048	0.020	-0.00	-10.98	10.98	383.33	229.54	1.00	1.00	2.45	185.82	123.88
Dsgn. L = 8.25 ft	3	0.048	0.017		-10.98	10.98	383.33	229.54	1.00	1.00	2.09	185.82	123.88

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0247	5.500		0.0000	0.000
	2	0.0000	5.500	+D+S	-0.0147	3.227
+D+S	3	0.2728	8.250		0.0000	3.227

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	8.027		36.728	
Max Upward from Load Combinations	8.027		36.728	
Max Upward from Load Cases	6.454		29.171	
Max Downward from all Load Conditions (Resis		-3.622		
Max Downward from Load Combinations (Resis		-3.622		
Max Downward from Load Cases (Resisting Up		-2.754		
D Only	1.573	-0.867	7.558	
+D+S	8.027	-3.622	36.728	
+D+0.750S	6.413	-2.933	29.436	
+0.60D	0.944	-0.520	4.535	
S Only	6.454	-2.754	29.171	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-23

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

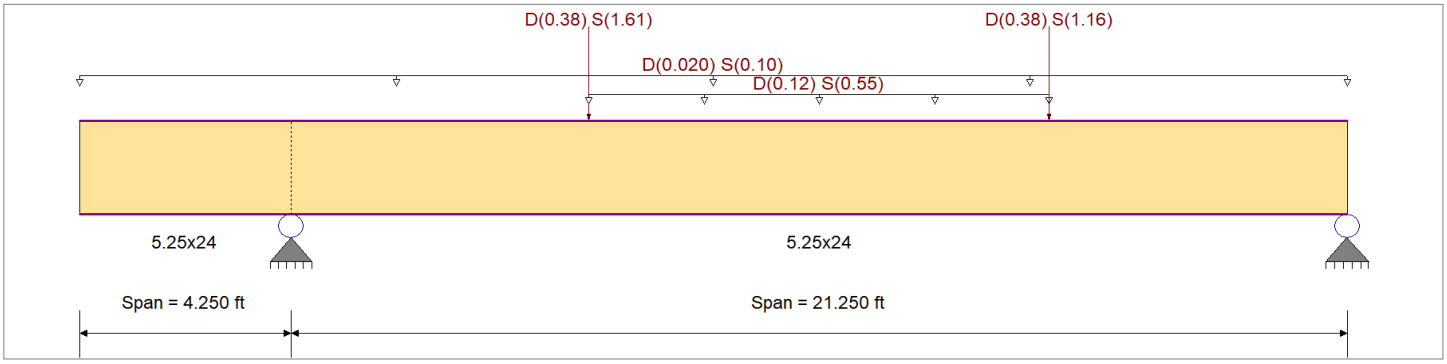
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft
Load for Span Number 2
Point Load : D = 0.380, S = 1.610 k @ 6.0 ft
Uniform Load : D = 0.120, S = 0.550 k/ft, Extent = 6.0 -->> 15.250 ft, Tributary Width = 1.0 ft
Point Load : D = 0.380, S = 1.160 k @ 15.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.307 : 1	Maximum Shear Stress Ratio	=	0.220 : 1
Section used for this span		5.25x24	Section used for this span		5.25x24
fb: Actual	=	1,013.88 psi	fv: Actual	=	72.14 psi
F'b	=	3,300.74 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	10.566 ft	Location of maximum on span	=	4.250 ft
Span # where maximum occurs	=	Span # 2	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.229 in	Ratio =	1112 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.141 in	Ratio =	724 >=360	Span: 1 : S Only
Max Downward Total Deflection	0.282 in	Ratio =	904 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.173 in	Ratio =	588 >=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.002	0.052	0.90	1.00	1.00	1.00	0.926	1.00	1.00	1.00	0.18	4.3	2,583.2	1.12	13.3	256.5
Length = 21.250 ft	2	0.073	0.052	0.90	1.00	1.00	1.00	0.926	1.00	1.00	1.00	7.93	188.9	2,583.2	1.12	13.3	256.5
+D+S					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	1	0.008	0.220	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	1.08	25.8	3,300.7	6.06	72.1	327.8
Length = 21.250 ft	2	0.307	0.220	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	42.58	1,013.9	3,300.7	6.06	72.1	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-23

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750S					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	**1**	0.006	0.175	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	0.86	20.4	3,300.7	4.82	57.4	327.8
Length = 21.250 ft	**2**	0.245	0.175	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	33.92	807.6	3,300.7	4.82	57.4	327.8
+0.60D					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.250 ft	**1**	0.001	0.018	1.60	1.00	1.00	1.00	0.926	1.00	1.00	1.00	0.11	2.6	4,592.3	0.67	8.0	456.0
Length = 21.250 ft	**2**	0.025	0.018	1.60	1.00	1.00	1.00	0.926	1.00	1.00	1.00	4.76	113.3	4,592.3	0.67	8.0	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.1732	0.000
+D+S	2	0.2819	10.684		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		6.798	5.990
Max Upward from Load Combinations		6.798	5.990
Max Upward from Load Cases		5.557	4.851
D Only		1.241	1.139
+D+S		6.798	5.990
+D+0.750S		5.409	4.777
+0.60D		0.745	0.683
S Only		5.557	4.851

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-24

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

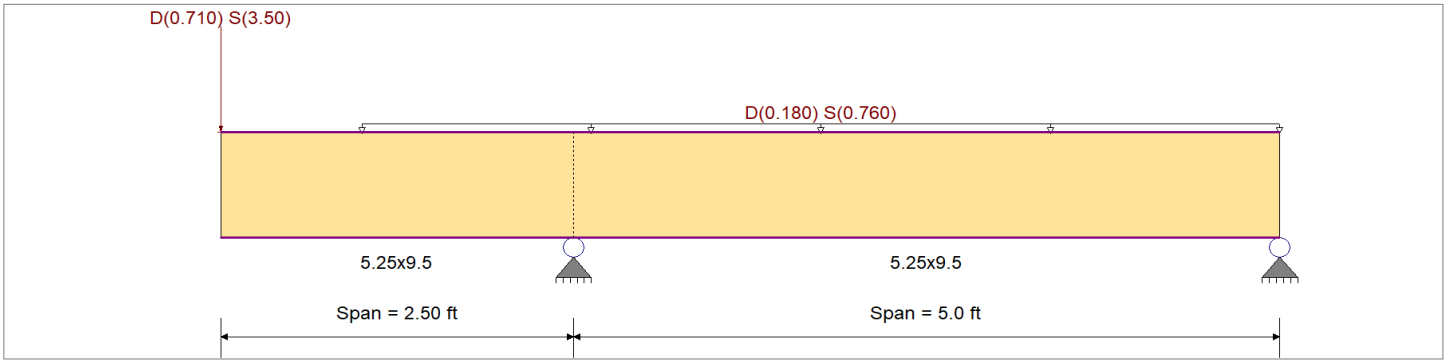
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Partial Length Uniform Load : D = 0.180, S = 0.760 k/ft, Extent = 1.0 -->> 7.50 ft
Point Load : D = 0.710, S = 3.50 k, Starting at : 0.0 ft and placed every 0.0 ft thereafter

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.481 : 1	Maximum Shear Stress Ratio	=	0.448 : 1
Section used for this span		5.25x9.5	Section used for this span		5.25x9.5
fb: Actual	=	1,760.06 psi	fv: Actual	=	146.91 psi
F'b	=	3,658.75 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	2.500 ft	Location of maximum on span	=	1.718 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.114 in	Ratio =	526 >=360	Span: 1 : S Only
Max Upward Transient Deflection	-0.022 in	Ratio =	2689 >=360	Span: 2 : S Only
Max Downward Total Deflection	0.136 in	Ratio =	440 >=180	Span: 1 : +D+S
Max Upward Total Deflection	-0.026 in	Ratio =	2264 >=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.105	0.098	0.90	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.98	300.5	2,863.4	0.84	25.2	256.5
Length = 5.0 ft	2	0.105	0.098	0.90	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.98	300.5	2,863.4	0.70	25.2	256.5
+D+S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.481	0.448	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	11.58	1,760.1	3,658.7	4.88	146.9	327.8
Length = 5.0 ft	2	0.481	0.448	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	11.58	1,760.1	3,658.7	3.93	146.9	327.8
+D+0.750S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.381	0.355	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	9.18	1,395.2	3,658.7	3.87	116.5	327.8
Length = 5.0 ft	2	0.381	0.355	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	9.18	1,395.2	3,658.7	3.12	116.5	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-24

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	**1**	0.035	0.033	1.60	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.19	180.3	5,090.4	0.50	15.1	456.0
Length = 5.0 ft	**2**	0.035	0.033	1.60	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.19	180.3	5,090.4	0.42	15.1	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1363	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0265	1.872

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		10.287	0.054
Max Upward from Load Combinations		10.287	0.039
Max Upward from Load Cases		8.461	0.054
Max Downward from all Load Conditio			-0.021
Max Downward from Load Cases (Resis			-0.021
D Only		1.826	0.054
+D+S		10.287	0.033
+D+0.750S		8.171	0.039
+0.60D		1.095	0.033
S Only		8.461	-0.021

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-25

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

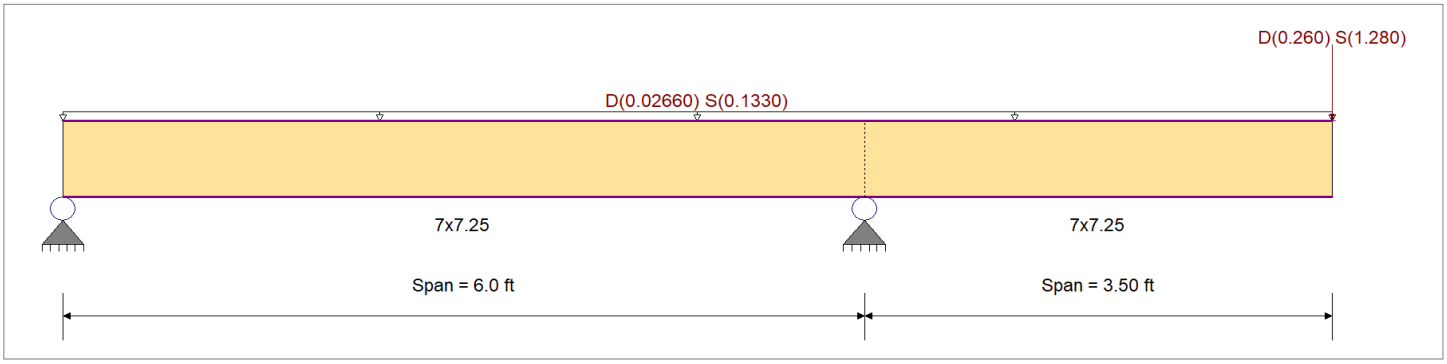
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft
Point Load : D = 0.260, S = 1.280 k, Starting at : 9.50 ft and placed every 0.0 ft thereafter

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.330 : 1	Maximum Shear Stress Ratio	=	0.181 : 1
Section used for this span		7x7.25	Section used for this span		7x7.25
fb: Actual	=	1,246.04 psi	fv: Actual	=	59.26 psi
F'b	=	3,770.30 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	6.000 ft	Location of maximum on span	=	6.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.208 in	Ratio =	402	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.039 in	Ratio =	1828	>=360	Span: 1 : S Only
Max Downward Total Deflection	0.250 in	Ratio =	334	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.047 in	Ratio =	1519	>=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.071	0.039	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.07	210.0	2,950.7	0.34	10.0	256.5
Length = 3.50 ft	2	0.071	0.039	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.07	210.0	2,950.7	0.34	10.0	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.330	0.181	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.37	1,246.0	3,770.3	2.00	59.3	327.8
Length = 3.50 ft	2	0.330	0.181	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.37	1,246.0	3,770.3	2.00	59.3	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	1	0.262	0.143	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.04	987.0	3,770.3	1.59	46.9	327.8
Length = 3.50 ft	2	0.262	0.143	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.04	987.0	3,770.3	1.59	46.9	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-25

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.0 ft	**1**	0.024	0.013	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.64	126.0	5,245.6	0.20	6.0	456.0
Length = 3.50 ft	**2**	0.024	0.013	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.64	126.0	5,245.6	0.20	6.0	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0474	3.587
+D+S	2	0.2505	3.500		0.0000	3.587

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		3.639	
Max Upward from Load Combinations		3.639	
Max Upward from Load Cases		3.027	
Max Downward from all Load Conditio	-0.582		
Max Downward from Load Combinations	-0.582		
Max Downward from Load Cases (Resis	-0.483		
D Only	-0.099	0.612	
+D+S	-0.582	3.639	
+D+0.750S	-0.462	2.882	
+0.60D	-0.059	0.367	
S Only	-0.483	3.027	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-26

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

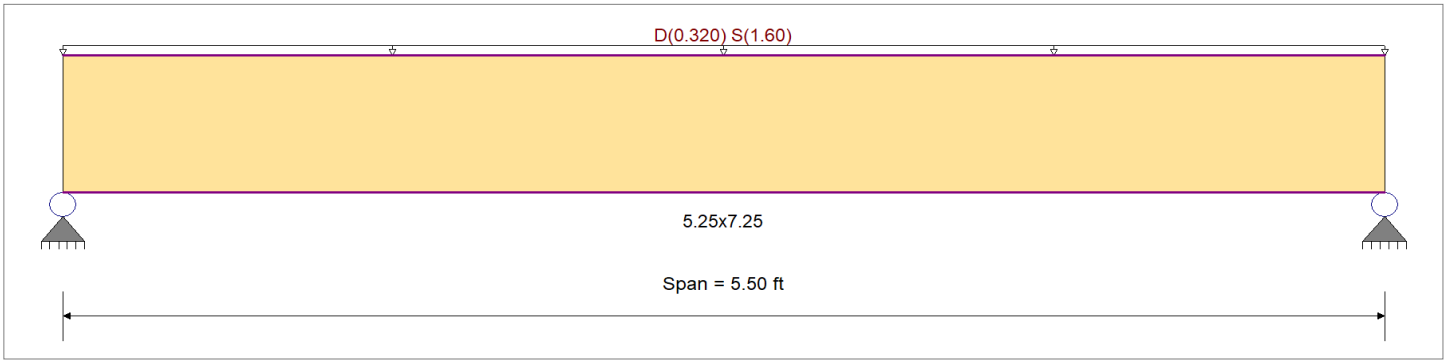
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3100 psi
Fb -	3100 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.320, S = 1.60 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.502 : 1	Maximum Shear Stress Ratio	=	0.496 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	1,894.23 psi	fv: Actual	=	162.51 psi
F'b	=	3,770.30 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	2.750 ft	Location of maximum on span	=	4.898 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.099 in	Ratio =	664 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.119 in	Ratio =	553 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.50 ft	1	0.107	0.106	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.21	315.7	2,950.7	0.69	27.1	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.50 ft	1	0.502	0.496	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	7.26	1,894.2	3,770.3	4.12	162.5	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.50 ft	1	0.398	0.393	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.75	1,499.6	3,770.3	3.26	128.7	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.50 ft	1	0.036	0.036	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.73	189.4	5,245.6	0.41	16.3	456.0

Wood Beam

DESCRIPTION: B4-26

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1192	2.770		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.280	5.280
Max Upward from Load Combinations	5.280	5.280
Max Upward from Load Cases	4.400	4.400
D Only	0.880	0.880
+D+S	5.280	5.280
+D+0.750S	4.180	4.180
+0.60D	0.528	0.528
S Only	4.400	4.400

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-27

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

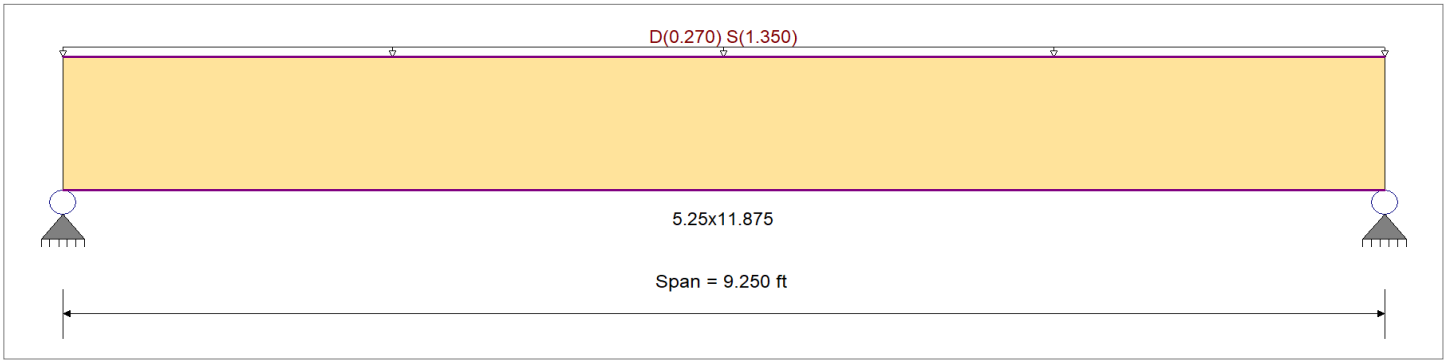
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3100 psi
Fb -	3100 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.270, S = 1.350 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.472 : 1	Maximum Shear Stress Ratio	=	0.434 : 1
Section used for this span		5.25x11.875	Section used for this span		5.25x11.875
fb: Actual	=	1,685.06 psi	fv: Actual	=	142.11 psi
F'b	=	3,569.15 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.625 ft	Location of maximum on span	=	8.271 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.153 in	Ratio =	727 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.183 in	Ratio =	605 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.101	0.092	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.89	280.8	2,793.2	0.98	23.7	256.5
+D+S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.472	0.434	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	17.33	1,685.1	3,569.2	5.91	142.1	327.8
+D+0.750S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.374	0.343	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.72	1,334.0	3,569.2	4.68	112.5	327.8
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.250 ft	1	0.034	0.031	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.73	168.5	4,965.8	0.59	14.2	456.0

Wood Beam

DESCRIPTION: B4-27

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1832	4.659		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.493	7.493
Max Upward from Load Combinations	7.493	7.493
Max Upward from Load Cases	6.244	6.244
D Only	1.249	1.249
+D+S	7.493	7.493
+D+0.750S	5.932	5.932
+0.60D	0.749	0.749
S Only	6.244	6.244

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-28

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

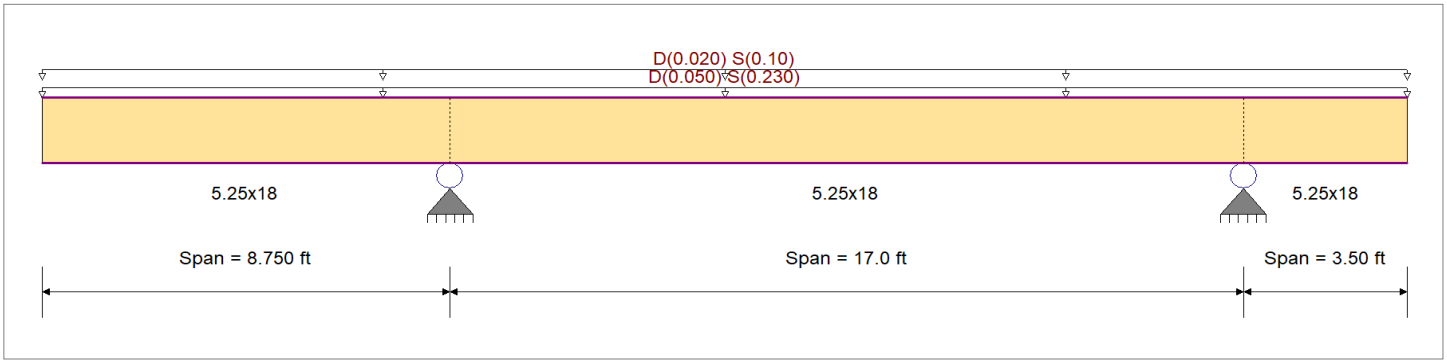
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3100 psi
Fb -	3100 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.050, S = 0.230 k/ft
Uniform Load on ALL spans : D = 0.020, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.190 : 1	Maximum Shear Stress Ratio	=	0.174 : 1
Section used for this span		5.25x18	Section used for this span		5.25x18
fb: Actual	=	648.15 psi	fv: Actual	=	56.91 psi
F'b	=	3,407.95 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	8.750 ft	Location of maximum on span	=	8.750 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.111 in	Ratio =	1886 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.022 in	Ratio =	3820 >=360	Span: 3 : S Only
Max Downward Total Deflection	0.135 in	Ratio =	1556 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.027 in	Ratio =	3152 >=180	Span: 3 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 8.750 ft	1	0.043	0.039	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	2.68	113.4	2,667.1	0.63	10.0	256.5
Length = 17.0 ft	2	0.043	0.039	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	2.68	113.4	2,667.1	0.63	10.0	256.5
Length = 3.50 ft	3	0.007	0.039	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	0.43	18.1	2,667.1	0.14	10.0	256.5
+D+S					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.750 ft	1	0.190	0.174	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	15.31	648.1	3,408.0	3.59	56.9	327.8
Length = 17.0 ft	2	0.190	0.174	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	15.31	648.1	3,408.0	3.59	56.9	327.8
Length = 3.50 ft	3	0.030	0.174	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	2.45	103.7	3,408.0	0.80	56.9	327.8
+D+0.750S					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-28

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 8.750 ft	**1**	0.151	0.138	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	12.15	514.5	3,408.0	2.85	45.2	327.8
Length = 17.0 ft	**2**	0.151	0.138	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	12.15	514.5	3,408.0	2.85	45.2	327.8
Length = 3.50 ft	**3**	0.024	0.138	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	1.94	82.3	3,408.0	0.63	45.2	327.8
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 8.750 ft	**1**	0.014	0.013	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	1.61	68.1	4,741.5	0.38	6.0	456.0
Length = 17.0 ft	**2**	0.014	0.013	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	1.61	68.1	4,741.5	0.38	6.0	456.0
Length = 3.50 ft	**3**	0.002	0.013	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	0.26	10.9	4,741.5	0.08	6.0	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1348	0.000		0.0000	0.000
+D+S	2	0.0408	10.143	+D+S	-0.0020	1.000
	3	0.0000	10.143	+D+S	-0.0266	3.500

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions		7.657	4.043	
Max Upward from Load Combinations		7.657	4.043	
Max Upward from Load Cases		6.317	3.336	
D Only		1.340	0.708	
+D+S		7.657	4.043	
+D+0.750S		6.077	3.209	
+0.60D		0.804	0.425	
S Only		6.317	3.336	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-29

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

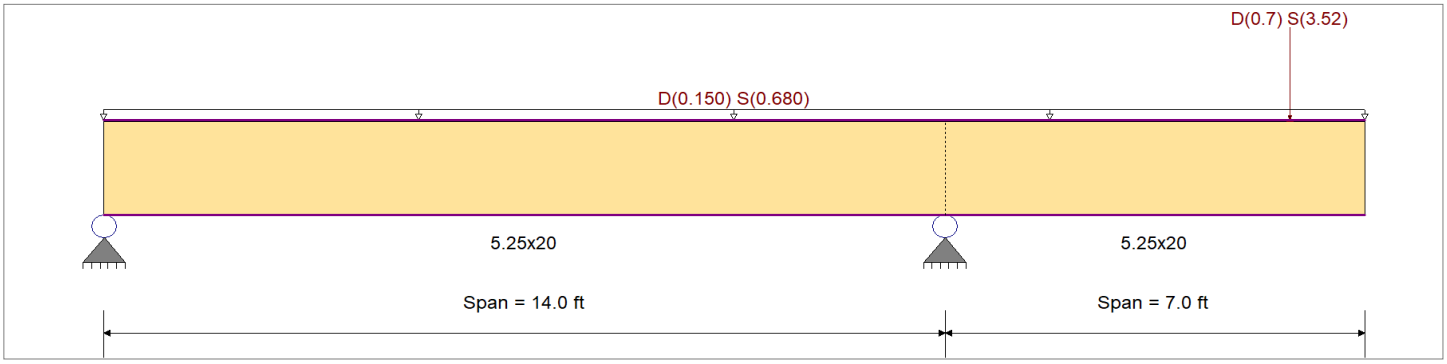
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.150, S = 0.680 k/ft
Load for Span Number 2
Point Load : D = 0.70, S = 3.520 k @ 5.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.454 : 1	Maximum Shear Stress Ratio	=	0.378 : 1
Section used for this span		5.25x20	Section used for this span		5.25x20
fb: Actual	=	1,529.14 psi	fv: Actual	=	123.81 psi
F'b	=	3,368.29 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	14.000 ft	Location of maximum on span	=	14.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.286 in	Ratio =	586 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.038 in	Ratio =	4401 >=360	Span: 1 : S Only
Max Downward Total Deflection	0.344 in	Ratio =	488 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.045 in	Ratio =	3704 >=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 14.0 ft	1	0.100	0.084	0.90	1.00	1.00	1.00	0.945	1.00	1.00	1.00	7.70	264.0	2,636.1	1.50	21.5	256.5
Length = 7.0 ft	2	0.100	0.084	0.90	1.00	1.00	1.00	0.945	1.00	1.00	1.00	7.70	264.0	2,636.1	1.50	21.5	256.5
+D+S					1.00	1.00	1.00	0.945	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.0 ft	1	0.454	0.378	1.15	1.00	1.00	1.00	0.945	1.00	1.00	1.00	44.60	1,529.1	3,368.3	8.67	123.8	327.8
Length = 7.0 ft	2	0.454	0.378	1.15	1.00	1.00	1.00	0.945	1.00	1.00	1.00	44.60	1,529.1	3,368.3	8.67	123.8	327.8
+D+0.750S					1.00	1.00	1.00	0.945	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.0 ft	1	0.360	0.300	1.15	1.00	1.00	1.00	0.945	1.00	1.00	1.00	35.38	1,212.9	3,368.3	6.88	98.2	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-29

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 7.0 ft	**2**	0.360	0.300	1.15	1.00	1.00	1.00	0.945	1.00	1.00	1.00	35.38	1,212.9	3,368.3	6.88	98.2	327.8
+0.60D					1.00	1.00	1.00	0.945	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 14.0 ft	**1**	0.034	0.028	1.60	1.00	1.00	1.00	0.945	1.00	1.00	1.00	4.62	158.4	4,686.3	0.90	12.9	456.0
Length = 7.0 ft	**2**	0.034	0.028	1.60	1.00	1.00	1.00	0.945	1.00	1.00	1.00	4.62	158.4	4,686.3	0.90	12.9	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0454	10.168
+D+S	2	0.3441	7.000		0.0000	10.168

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	2.624	19.026	
Max Upward from Load Combinations	2.624	19.026	
Max Upward from Load Cases	2.124	15.676	
D Only	0.500	3.350	
+D+S	2.624	19.026	
+D+0.750S	2.093	15.107	
+0.60D	0.300	2.010	
S Only	2.124	15.676	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-30

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

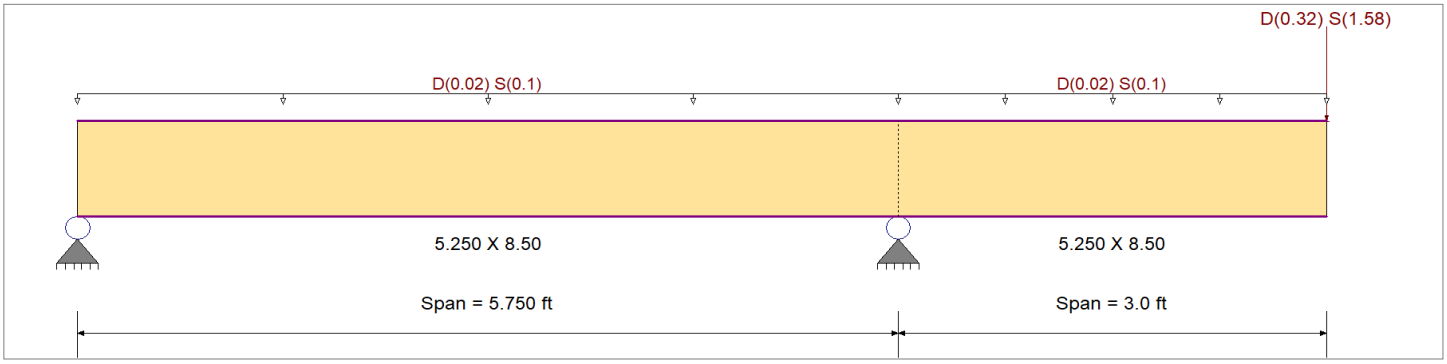
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : D = 0.020, S = 0.10 , Tributary Width = 1.0 ft
Load for Span Number 2
Point Load : D = 0.320, S = 1.580 k @ 3.0 ft
Uniform Load : D = 0.020, S = 0.10 ksf, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.314 : 1	Maximum Shear Stress Ratio	=	0.223 : 1
Section used for this span		5.250 X 8.50	Section used for this span		5.250 X 8.50
fb: Actual	=	1,184.46 psi	fv: Actual	=	73.13 psi
F'b	=	3,770.30 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.750 ft	Location of maximum on span	=	5.750 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.137 in	Ratio =	524 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.031 in	Ratio =	2212 >=360	Span: 1 : S Only
Max Downward Total Deflection	0.165 in	Ratio =	436 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.038 in	Ratio =	1839 >=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.068	0.048	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.05	199.3	2,950.7	0.37	12.3	256.5
Length = 3.0 ft	2	0.068	0.048	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.05	199.3	2,950.7	0.37	12.3	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.314	0.223	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.24	1,184.5	3,770.3	2.18	73.1	327.8
Length = 3.0 ft	2	0.314	0.223	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.24	1,184.5	3,770.3	2.18	73.1	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-30

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 5.750 ft	**1**	0.249	0.177	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.94	938.2	3,770.3	1.72	57.9	327.8
Length = 3.0 ft	**2**	0.249	0.177	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.94	938.2	3,770.3	1.72	57.9	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	**1**	0.023	0.016	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.63	119.6	5,245.6	0.22	7.4	456.0
Length = 3.0 ft	**2**	0.023	0.016	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.63	119.6	5,245.6	0.22	7.4	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0375	3.405
+D+S	2	0.1649	3.000		0.0000	3.405

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		3.690	
Max Upward from Load Combinations		3.690	
Max Upward from Load Cases		3.070	
Max Downward from all Load Conditio	-0.740		
Max Downward from Load Combinations	-0.740		
Max Downward from Load Cases (Resis	-0.615		
D Only	-0.125	0.620	
+D+S	-0.740	3.690	
+D+0.750S	-0.586	2.923	
+0.60D	-0.075	0.372	
S Only	-0.615	3.070	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-31

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

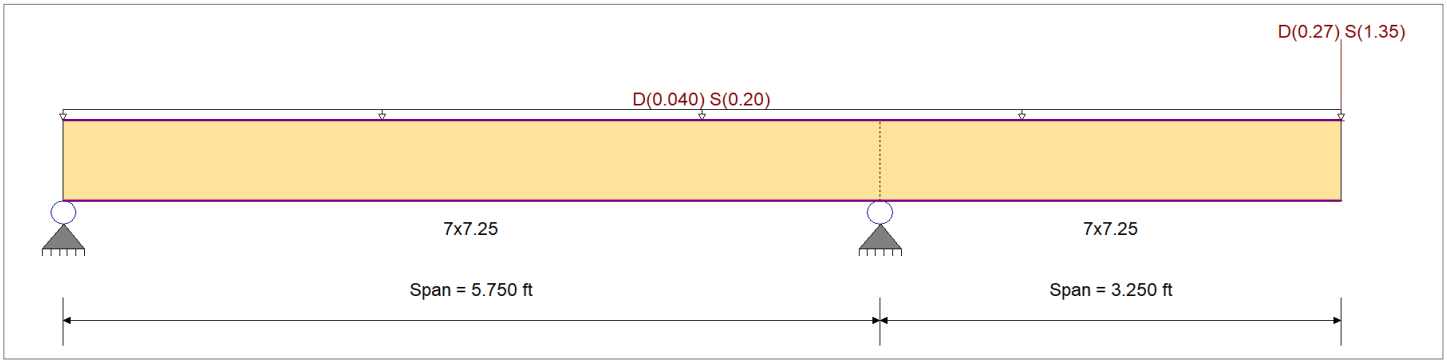
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2800 psi
Fb -	2800 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 2.0 ft
Load for Span Number 2
Point Load : D = 0.270, S = 1.350 k @ 3.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.375 : 1	Maximum Shear Stress Ratio	=	0.203 : 1
Section used for this span		7x7.25	Section used for this span		7x7.25
fb: Actual	=	1,278.31 psi	fv: Actual	=	66.69 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.750 ft	Location of maximum on span	=	5.750 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.182 in	Ratio =	426 >=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.034 in	Ratio =	2002 >=360	Span: 1 : S Only
Max Downward Total Deflection	0.219 in	Ratio =	356 >=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.041 in	Ratio =	1668 >=180	Span: 1 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.080	0.043	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.09	213.1	2,665.1	0.38	11.1	256.5
Length = 3.250 ft	2	0.080	0.043	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.09	213.1	2,665.1	0.38	11.1	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.375	0.203	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.53	1,278.3	3,405.4	2.26	66.7	327.8
Length = 3.250 ft	2	0.375	0.203	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	6.53	1,278.3	3,405.4	2.26	66.7	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	1	0.297	0.161	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.17	1,012.0	3,405.4	1.79	52.8	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B4-31

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 3.250 ft	**2**	0.297	0.161	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	5.17	1,012.0	3,405.4	1.79	52.8	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.750 ft	**1**	0.027	0.015	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.65	127.8	4,738.0	0.23	6.7	456.0
Length = 3.250 ft	**2**	0.027	0.015	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.65	127.8	4,738.0	0.23	6.7	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.0414	3.501
+D+S	2	0.2189	3.250		0.0000	3.501

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		4.226	
Max Upward from Load Combinations		4.226	
Max Upward from Load Cases		3.522	
Max Downward from all Load Conditio	-0.446		
Max Downward from Load Combinations	-0.446		
Max Downward from Load Cases (Resis	-0.372		
D Only	-0.074	0.704	
+D+S	-0.446	4.226	
+D+0.750S	-0.353	3.346	
+0.60D	-0.045	0.423	
S Only	-0.372	3.522	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Southwest Corner Strucutral Fascia

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

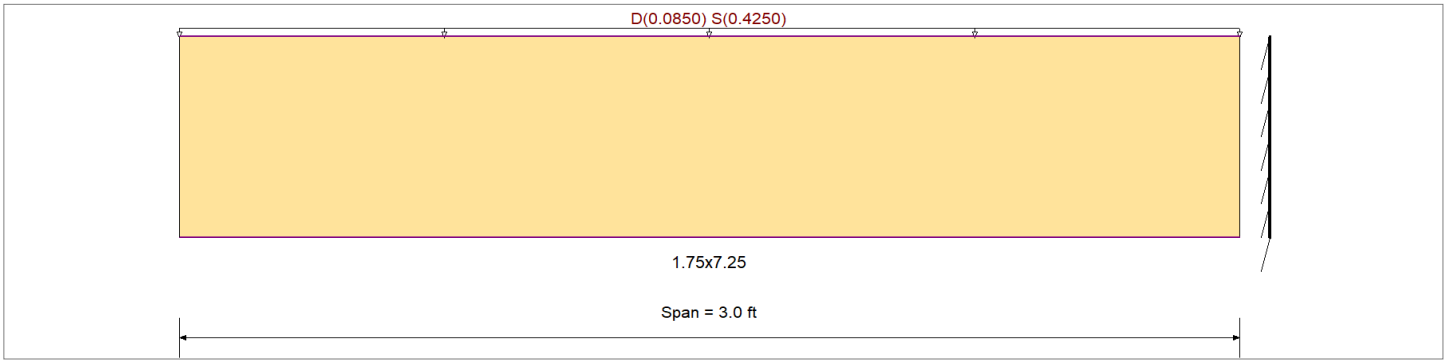
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 4.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.528 : 1	Maximum Shear Stress Ratio	=	0.441 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	1,796.39 psi	fv: Actual	=	144.58 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	3.000 ft	Location of maximum on span	=	2.398 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.067 in	Ratio =	1072 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.080 in	Ratio =	894 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.112	0.094	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.38	299.4	2,665.1	0.20	24.1	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.528	0.441	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.29	1,796.4	3,405.4	1.22	144.6	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.418	0.349	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.82	1,422.1	3,405.4	0.97	114.5	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.038	0.032	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.23	179.6	4,738.0	0.12	14.5	456.0

Wood Beam

DESCRIPTION: Southwest Corner Strucutral Fascia

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0805	0.000		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions		1.530
Max Upward from Load Combinations		1.530
Max Upward from Load Cases		1.275
D Only		0.255
+D+S		1.530
+D+0.750S		1.211
+0.60D		0.153
S Only		1.275

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Northeast Corner

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

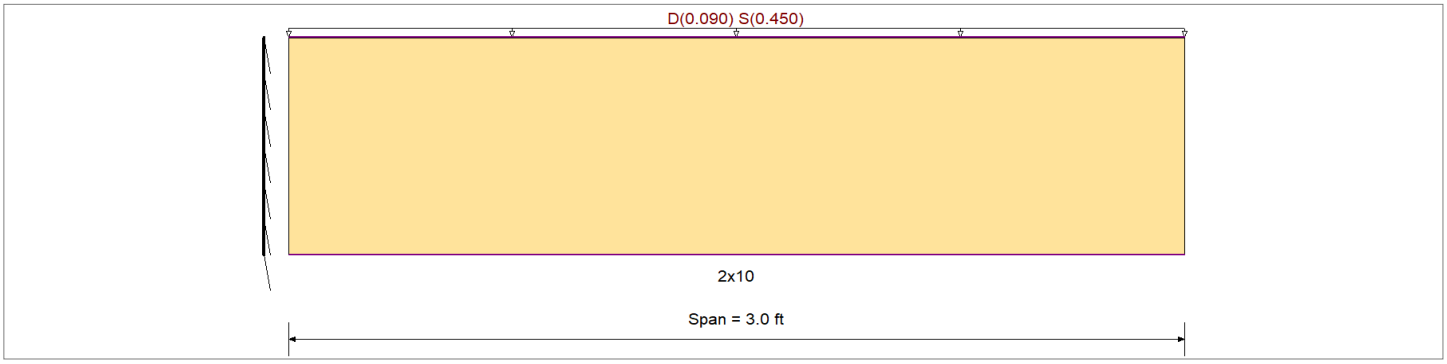
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2800 psi
Fb -	2800 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	1530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 4.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.423 : 1	Maximum Shear Stress Ratio	=	0.398 : 1
Section used for this span		2x10	Section used for this span		2x10
fb: Actual	=	1,363.21 psi	fv: Actual	=	130.39 psi
F'b	=	3,220.00 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	0.000 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.040 in	Ratio =	1812 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.048 in	Ratio =	1510 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.090	0.085	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.41	227.2	2,520.0	0.20	21.7	256.5
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.423	0.398	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.43	1,363.2	3,220.0	1.21	130.4	327.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.335	0.315	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.92	1,079.2	3,220.0	0.95	103.2	327.8
+0.60D					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 3.0 ft	1	0.030	0.029	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.24	136.3	4,480.0	0.12	13.0	456.0

Wood Beam

DESCRIPTION: Northeast Corner

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0476	3.000		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.620	
Max Upward from Load Combinations	1.620	
Max Upward from Load Cases	1.350	
D Only	0.270	
+D+S	1.620	
+D+0.750S	1.283	
+0.60D	0.162	
S Only	1.350	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

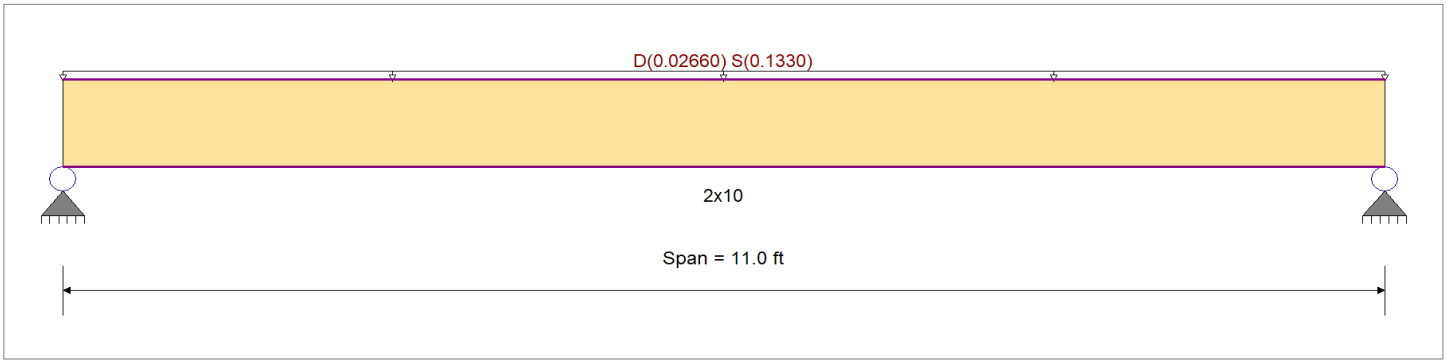
DESCRIPTION: 14" BCI @ 16"o.c.

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	2800 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	2800 psi	Ebend- xx	2000 ksi
		Fc - Prll	3000 psi	Eminbend - xx	2530120482 ksi
Wood Species :	Boise Cascade	Fc - Perp	750 psi		
Wood Grade :	Versa Lam 2800	Fv	285 psi		
		Ft	2100 psi	Density	41.76 pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.421 : 1	Maximum Shear Stress Ratio	=	0.249 : 1
Section used for this span		2x10	Section used for this span		2x10
fb: Actual	=	1,354.21 psi	fv: Actual	=	81.74 psi
F'b	=	3,220.00 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.500 ft	Location of maximum on span	=	10.237 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.223 in	Ratio =	592 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.267 in	Ratio =	493 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.090	0.053	0.90	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.40	225.7	2,520.0	0.13	13.6	256.5
+D+S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.421	0.249	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	2.41	1,354.2	3,220.0	0.76	81.7	327.8
+D+0.750S					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.333	0.197	1.15	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.91	1,072.1	3,220.0	0.60	64.7	327.8
+0.60D					1.00	1.00	1.00	1.000	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 11.0 ft	1	0.030	0.018	1.60	1.00	1.00	1.00	1.000	1.00	1.00	1.00	0.24	135.4	4,480.0	0.08	8.2	456.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: 14" BCI @ 16"o.c.

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.2673	5.540		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.878	0.878
Max Upward from Load Combinations	0.878	0.878
Max Upward from Load Cases	0.732	0.732
D Only	0.146	0.146
+D+S	0.878	0.878
+D+0.750S	0.695	0.695
+0.60D	0.088	0.088
S Only	0.732	0.732

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

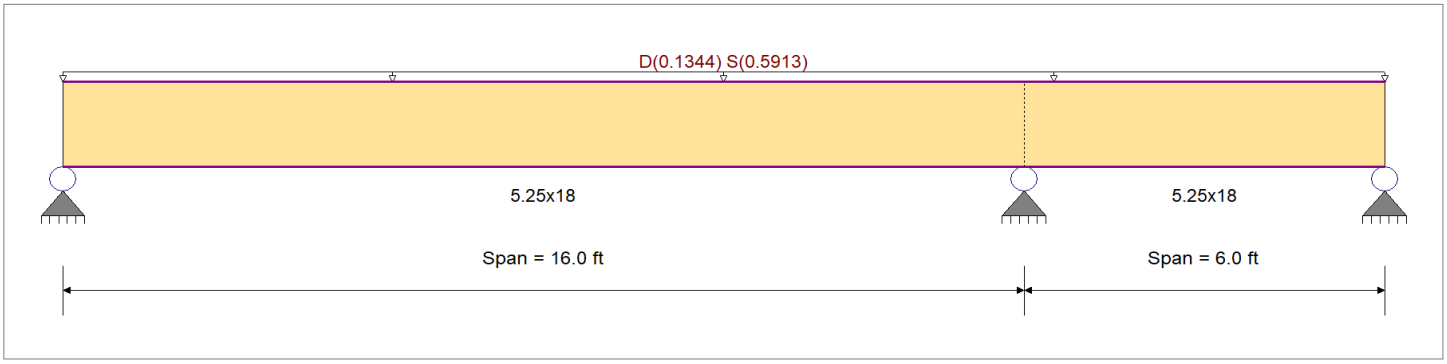
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.0250, S = 0.110 ksf, Tributary Width = 5.375 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.229 : 1	Maximum Shear Stress Ratio	=	0.295 : 1
Section used for this span		5.25x18	Section used for this span		5.25x18
fb: Actual	=	780.92 psi	fv: Actual	=	96.83 psi
F'b	=	3,407.95 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	16.000 ft	Location of maximum on span	=	14.570 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.095 in	Ratio =	2028 >=360	Span: 1 : S Only
Max Upward Transient Deflection	-0.008 in	Ratio =	8755 >=360	Span: 2 : S Only
Max Downward Total Deflection	0.121 in	Ratio =	1592 >=180	Span: 1 : +D+S
Max Upward Total Deflection	-0.010 in	Ratio =	6874 >=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.0 ft	1	0.063	0.081	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	3.96	167.8	2,667.1	1.31	20.8	256.5
Length = 6.0 ft	2	0.063	0.081	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	3.96	167.8	2,667.1	0.91	20.8	256.5
+D+S					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.0 ft	1	0.229	0.295	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	18.45	780.9	3,408.0	6.10	96.8	327.8
Length = 6.0 ft	2	0.229	0.295	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	18.45	780.9	3,408.0	4.22	96.8	327.8
+D+0.750S					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.0 ft	1	0.184	0.237	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	14.83	627.6	3,408.0	4.90	77.8	327.8
Length = 6.0 ft	2	0.184	0.237	1.15	1.00	1.00	1.00	0.956	1.00	1.00	1.00	14.83	627.6	3,408.0	3.39	77.8	327.8

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-1

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.0 ft	**1**	0.021	0.027	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	2.38	100.7	4,741.5	0.79	12.5	456.0
Length = 6.0 ft	**2**	0.021	0.027	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	2.38	100.7	4,741.5	0.54	12.5	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1205	7.240		0.0000	0.000
	2	0.0000	7.240	+D+S	-0.0105	2.346

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	4.871	12.511	
Max Upward from Load Combinations	4.871	12.511	
Max Upward from Load Cases	3.825	9.823	
Max Downward from all Load Conditio			-0.816
Max Downward from Load Combinations			-0.816
Max Downward from Load Cases (Resis			-0.641
D Only	1.047	2.688	-0.175
+D+S	4.871	12.511	-0.816
+D+0.750S	3.915	10.055	-0.656
+0.60D	0.628	1.613	-0.105
S Only	3.825	9.823	-0.641

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-2

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

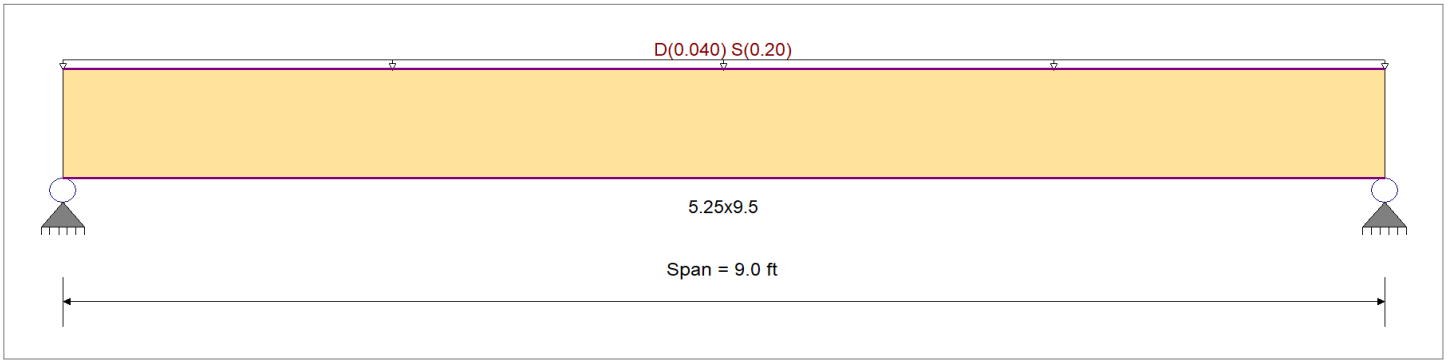
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3100 psi
Fb -	3100 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	1230120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, S = 0.10 ksf, Tributary Width = 2.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.101 : 1	Maximum Shear Stress Ratio	=	0.082 : 1
Section used for this span		5.25x9.5	Section used for this span		5.25x9.5
fb: Actual	=	369.26 psi	fv: Actual	=	26.79 psi
F'b	=	3,658.75 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.500 ft	Location of maximum on span	=	8.212 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.040 in	Ratio =	2728 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.048 in	Ratio =	2273 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.021	0.017	0.90	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.41	61.5	2,863.4	0.15	4.5	256.5
+D+S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.101	0.082	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	2.43	369.3	3,658.7	0.89	26.8	327.8
+D+0.750S					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.080	0.065	1.15	1.00	1.00	1.00	1.026	1.00	1.00	1.00	1.92	292.3	3,658.7	0.71	21.2	327.8
+0.60D					1.00	1.00	1.00	1.026	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 9.0 ft	1	0.007	0.006	1.60	1.00	1.00	1.00	1.026	1.00	1.00	1.00	0.24	36.9	5,090.4	0.09	2.7	456.0

Wood Beam

DESCRIPTION: B3-2

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0475	4.533		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.080	1.080
Max Upward from Load Combinations	1.080	1.080
Max Upward from Load Cases	0.900	0.900
D Only	0.180	0.180
+D+S	1.080	1.080
+D+0.750S	0.855	0.855
+0.60D	0.108	0.108
S Only	0.900	0.900

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-3

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

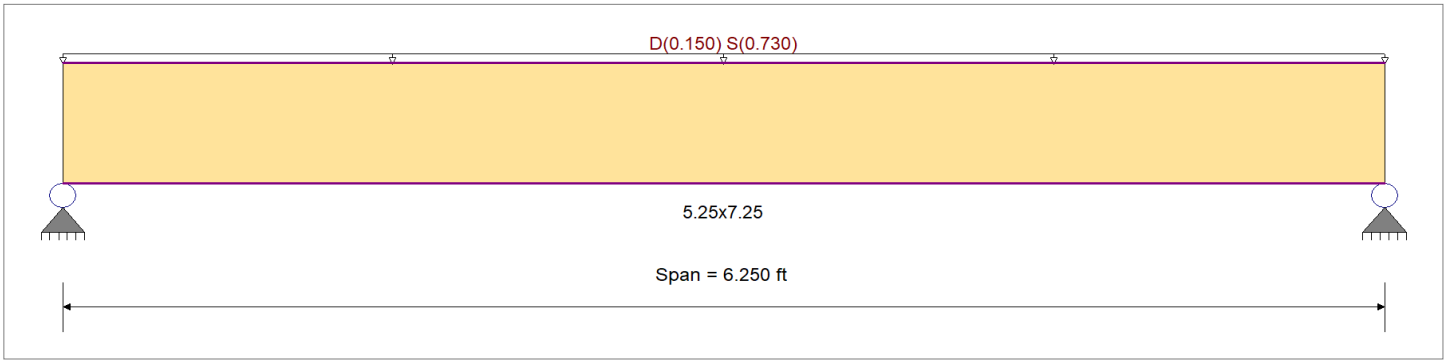
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3100 psi
Fb -	3100 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.150, S = 0.730 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.297 : 1	Maximum Shear Stress Ratio	=	0.268 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	1,121.11 psi	fv: Actual	=	87.81 psi
F'b	=	3,770.30 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	3.125 ft	Location of maximum on span	=	5.657 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.076 in	Ratio =	992 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.091 in	Ratio =	822 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.065	0.058	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.73	191.1	2,950.7	0.38	15.0	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.297	0.268	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.30	1,121.1	3,770.3	2.23	87.8	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.236	0.212	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	3.41	888.6	3,770.3	1.77	69.6	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.250 ft	1	0.022	0.020	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.44	114.7	5,245.6	0.23	9.0	456.0

Wood Beam

DESCRIPTION: B3-3

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0911	3.148		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.750	2.750
Max Upward from Load Combinations	2.750	2.750
Max Upward from Load Cases	2.281	2.281
D Only	0.469	0.469
+D+S	2.750	2.750
+D+0.750S	2.180	2.180
+0.60D	0.281	0.281
S Only	2.281	2.281

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-4

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

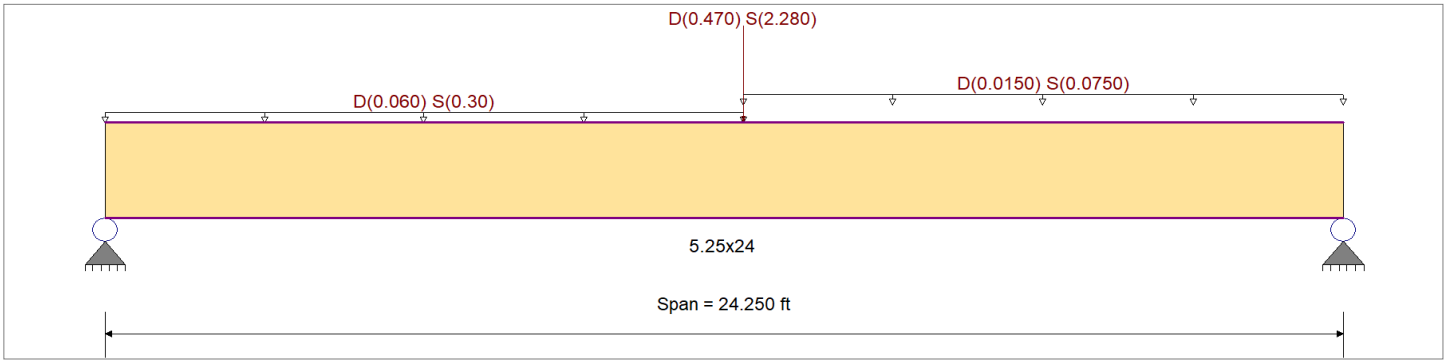
Wood Species : Douglas Fir-Larch (North)
Wood Grade : No. 1/No. 2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	1,000.0 psi
Fb -	1,000.0 psi
Fc - Prll	1,000.0 psi
Fc - Perp	1,000.0 psi
Fv	65.0 psi
Ft	65.0 psi

E : Modulus of Elasticity

Ebend- xx	1,300.0 ksi
Eminbend - xx	1,300.0 ksi
Density	34.0 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Partial Length Uniform Load : D = 0.020, S = 0.10 ksf, Extent = 0.0 -->> 12.50 ft, Tributary Width = 3.0 ft
Partial Length Uniform Load : D = 0.020, S = 0.10 ksf, Extent = 12.50 -->> 24.250 ft, Tributary Width = 0.750 ft
Point Load : D = 0.470, S = 2.280 k, Starting at : 12.50 ft and placed every 0.0 ft thereafter

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.749 : 1	Maximum Shear Stress Ratio	=	0.673 : 1
Section used for this span		5.25x24	Section used for this span		5.25x24
fb: Actual	=	797.07 psi	fv: Actual	=	50.33 psi
F'b	=	1,064.76 psi	F'v	=	74.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	12.479 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.342 in	Ratio =	851 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.411 in	Ratio =	707 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 24.250 ft	1	0.161	0.145	0.90	1.00	1.00	1.00	0.926	1.00	1.00	1.00	5.65	134.5	833.3	0.71	8.5	58.5
+D+S					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 24.250 ft	1	0.749	0.673	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	33.48	797.1	1,064.8	4.23	50.3	74.8
+D+0.750S					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 24.250 ft	1	0.593	0.533	1.15	1.00	1.00	1.00	0.926	1.00	1.00	1.00	26.52	631.4	1,064.8	3.35	39.9	74.8
+0.60D					1.00	1.00	1.00	0.926	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 24.250 ft	1	0.054	0.049	1.60	1.00	1.00	1.00	0.926	1.00	1.00	1.00	3.39	80.7	1,481.4	0.43	5.1	104.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B3-4

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.4112	11.948		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.929	3.379
Max Upward from Load Combinations	4.929	3.379
Max Upward from Load Cases	4.102	2.810
D Only	0.827	0.569
+D+S	4.929	3.379
+D+0.750S	3.903	2.676
+0.60D	0.496	0.341
S Only	4.102	2.810

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP1 Footing - Max Footing Loads

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	4.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.60

Increases based on footing Depth

Reference Depth below Surface	=	12.0 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

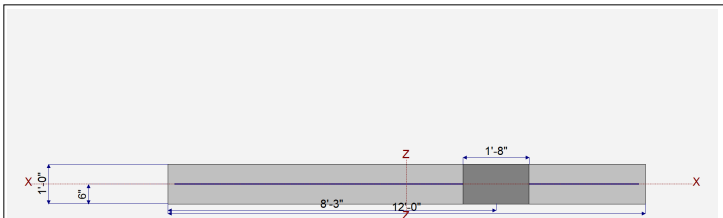
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

Adjusted Allowable Bearing Pressure = 0.0 ksf

Dimensions

Footing Width	=	12.0 ft	Footing Thickness	=	18.0 in	Bars along X-X Axis	
Wall Thickness	=	20.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	27 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 6

Reinforcing



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	13.0			2.60				k
OB : Overburden	=								ksf
V-x	=			3.0					k
M-zz	=			5.50					k-ft
Vx applied	=		in above top of footing						

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP1 Footing - Max Footing Loads

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.0	Soil Bearing	0.0 ksf	0.0 ksf	0.0
PASS	0.0	Z Flexure (+X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	0.0	Z Flexure (-X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	n/a	1-way Shear (+X)	0.0 psi	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in2	Gvrn. As in2	Actual As in2	Phi*Mn k-ft	Status

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP2 Footing - Max Footing Loads

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	4.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.60

Increases based on footing Depth

Reference Depth below Surface	=	12.0 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

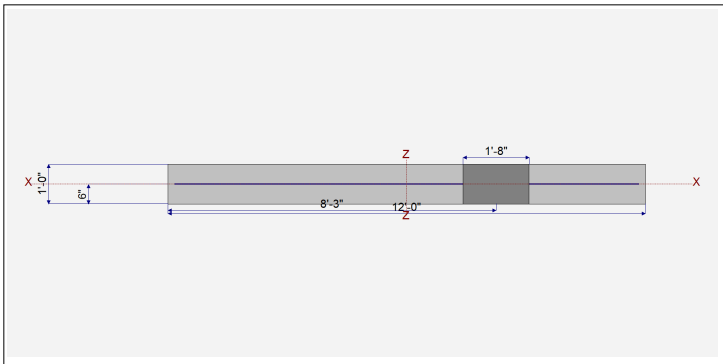
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

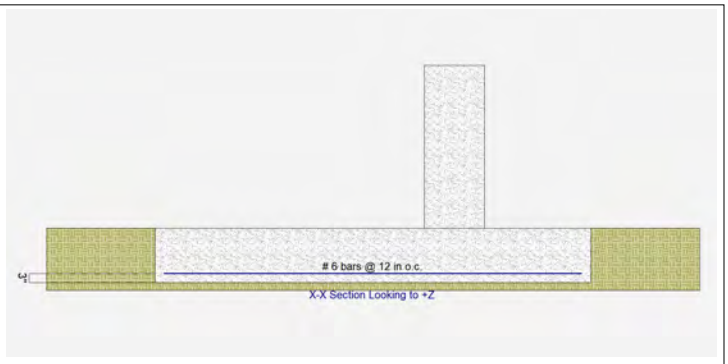
Adjusted Allowable Bearing Pressure = 0.0 ksf

Dimensions

Footing Width	=	12.0 ft	Footing Thickness	=	18.0 in	Bars along X-X Axis	
Wall Thickness	=	20.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	27 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 6

Reinforcing





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	16.20			2.850				k
OB : Overburden	=								ksf
V-x	=			3.10					k
M-zz	=			2.20					k-ft
Vx applied	=		in above top of footing						

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP2 Footing - Max Footing Loads

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.0	Soil Bearing	0.0 ksf	0.0 ksf	0.0
PASS	0.0	Z Flexure (+X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	0.0	Z Flexure (-X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	n/a	1-way Shear (+X)	0.0 psi	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in2	Gvrn. As in2	Actual As in2	Phi*Mn k-ft	Status

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP3 Footing - Max Footing Loads

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	4.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.60

Increases based on footing Depth

Reference Depth below Surface	=	12.0 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

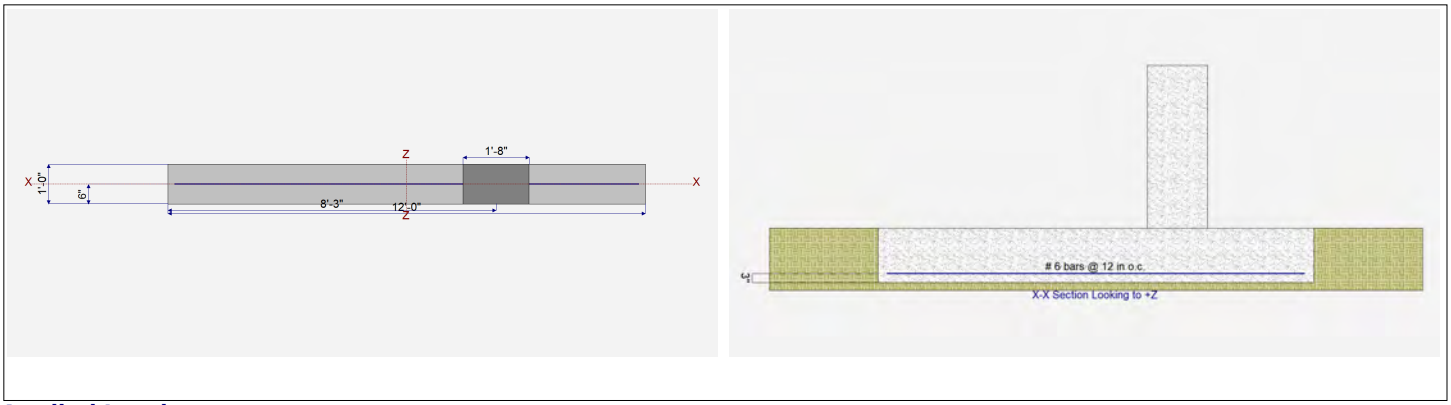
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

Adjusted Allowable Bearing Pressure = 0.0 ksf

Dimensions

Footing Width	=	12.0 ft	Footing Thickness	=	18.0 in	Bars along X-X Axis	
Wall Thickness	=	20.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	27 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 6

Reinforcing



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	10.470			1.50				k
OB : Overburden	=								ksf
V-x	=			4.50					k
M-zz	=			14.0					k-ft
Vx applied	=		in above top of footing						

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP3 Footing - Max Footing Loads

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.0	Soil Bearing	0.0 ksf	0.0 ksf	0.0
PASS	0.0	Z Flexure (+X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	0.0	Z Flexure (-X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	n/a	1-way Shear (+X)	0.0 psi	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in2	Gvrn. As in2	Actual As in2	Phi*Mn k-ft	Status

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP4 Footing - Max Footing Loads

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	4.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.60

Increases based on footing Depth

Reference Depth below Surface	=	12.0 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

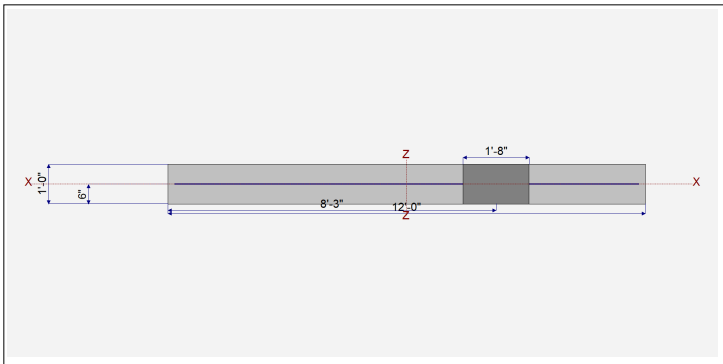
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

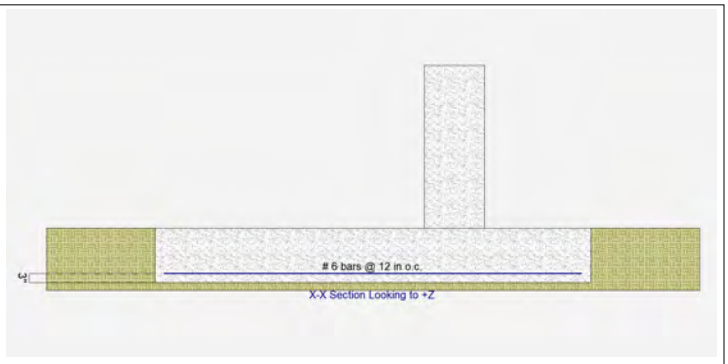
Adjusted Allowable Bearing Pressure = 0.0 ksf

Dimensions

Footing Width	=	12.0 ft	Footing Thickness	=	18.0 in	Bars along X-X Axis	
Wall Thickness	=	20.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	27 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 6

Reinforcing





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	9.760			1.240				k
OB : Overburden	=								ksf
V-x	=			4.50					k
M-zz	=			14.30					k-ft
Vx applied	=	in above top of footing							

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP4 Footing - Max Footing Loads

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.0	Soil Bearing	0.0 ksf	0.0 ksf	0.0
PASS	0.0	Z Flexure (+X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	0.0	Z Flexure (-X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	n/a	1-way Shear (+X)	0.0 psi	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in2	Gvrn. As in2	Actual As in2	Phi*Mn k-ft	Status

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP7 Footing - Max Footing Loads

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	2.0 : 1
Min. Sliding Safety Factor	=	1.50 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	4.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	400.0 pcf
Soil/Concrete Friction Coeff.	=	0.60

Increases based on footing Depth

Reference Depth below Surface	=	4.0 ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

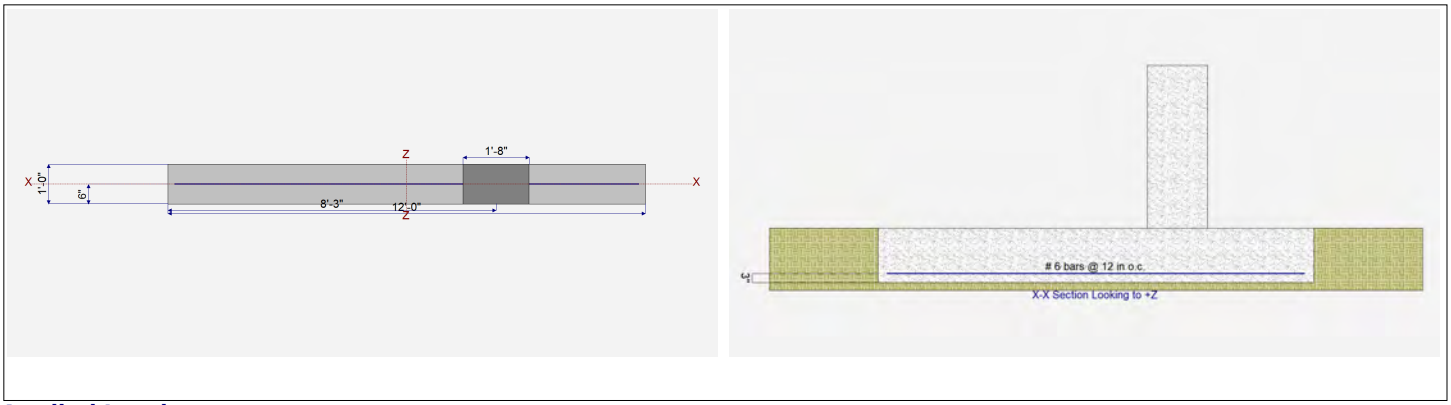
Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

Adjusted Allowable Bearing Pressure = 0.0 ksf

Dimensions

Footing Width	=	12.0 ft	Footing Thickness	=	18.0 in	Bars along X-X Axis	
Wall Thickness	=	20.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	27 in	at Bottom of footing	=	3.0 in	Reinforcing Bar Size	= # 6

Reinforcing



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	5.60			1.20				k
OB : Overburden	=								ksf
V-x	=			2.60					k
M-zz	=			13.80					k-ft
Vx applied	=	in above top of footing							

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wall Footing

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: WP7 Footing - Max Footing Loads

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.0	Soil Bearing	0.0 ksf	0.0 ksf	0.0
PASS	0.0	Z Flexure (+X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	0.0	Z Flexure (-X)	0.0 k-ft	0.0 k-ft	No Moment
PASS	n/a	1-way Shear (+X)	0.0 psi	0.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in2	Gvrn. As in2	Actual As in2	Phi*Mn k-ft	Status

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid A-6 Avalanche Wall

Code Reference

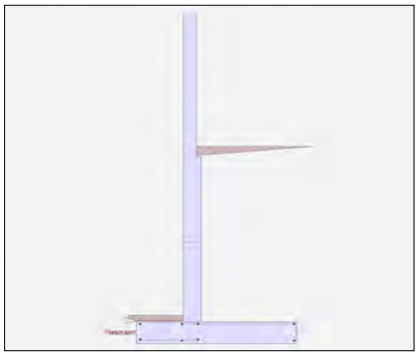
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	13.25 ft
Wall height above soil	=	10.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	400.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Live Load (L) (Service Level)
Wind on Exposed Stem (Strength Level)	=	130.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	40.0 lbs
Axial Live Load	=	200.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid A-6 Avalanche Wall

Design Summary

Wall Stability Ratios

Overturning	=	2.58	OK
Slab Resists All Sliding !			
Global Stability	=	2.31	
Total Bearing Load	=	15,393 lbs	
...resultant ecc.	=	18.00 in	
Eccentricity within middle third			
Soil Pressure @ Toe	=	2,820 psf	OK
Soil Pressure @ Heel	=	183 psf	OK
Allowable	=	4,000 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	3,949 psf	
ACI Factored @ Heel	=	256 psf	
Footing Shear @ Toe	=	26.8 psi	OK
Footing Shear @ Heel	=	20.2 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	4,673.9 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		3rd	2nd	Bottom		
		Stem OK	Stem OK	Stem OK		
Design Height Above Ftg	ft =	12.50	6.00	0.00		
Wall Material Above "Ht"	=	Concrete	Concrete	Concrete		
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00	14.00	14.00		
Rebar Size	=	# 5	# 6	# 9		
Rebar Spacing	=	8.00	8.00	8.00		
Rebar Placed at	=	Edge	Edge	Edge		
Design Data						
fb/FB + fa/Fa	=	**0.739**	**0.890**	**0.887**		
Total Force @ Section						
Service Level	lbs =					
Strength Level	lbs =	2,095.8	3,551.8	6,995.8		
Moment....Actual						
Service Level	ft-# =					
Strength Level	ft-# =	11,963.9	29,036.7	59,671.2		
Moment.....Allowable	ft-# =	16,175.5	32,598.7	67,246.9		
Shear.....Actual						
Service Level	psi =					
Strength Level	psi =	21.3	25.5	51.0		
Shear.....Allowable	psi =	82.2	82.2	82.2		
Anet (Masonry)	in2 =					
Wall Weight	psf =	125.0	175.0	175.0		
Rebar Depth 'd'	in =	8.19	11.63	11.44		

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	3,000.0	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0	60,000.0

Cantilevered Retaining Wall

DESCRIPTION: Grid A-6 Avalanche Wall

Concrete Stem Rebar Area Details

3rd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.3379 in2/ft		
(4/3) * As :	0.4505 in2/ft	Min Stem T&S Reinf Area 2.580 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.3379 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.465 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.5707 in2/ft		
(4/3) * As :	0.7609 in2/ft	Min Stem T&S Reinf Area 2.184 in2	
200bd/fy : 200(12)(11.625)/60000 :	0.465 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.336 in2/ft	
0.0018bh : 0.0018(12)(14) :	0.3024 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.5707 in2/ft	#4@ 7.14 in	#4@ 14.29 in
Provided Area :	0.66 in2/ft	#5@ 11.07 in	#5@ 22.14 in
Maximum Area :	1.8898 in2/ft	#6@ 15.71 in	#6@ 31.43 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	1.1926 in2/ft		
(4/3) * As :	1.5901 in2/ft	Min Stem T&S Reinf Area 2.016 in2	
200bd/fy : 200(12)(11.4375)/60000 :	0.4575 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.336 in2/ft	
0.0018bh : 0.0018(12)(14) :	0.3024 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	1.1926 in2/ft	#4@ 7.14 in	#4@ 14.29 in
Provided Area :	1.5 in2/ft	#5@ 11.07 in	#5@ 22.14 in
Maximum Area :	1.8593 in2/ft	#6@ 15.71 in	#6@ 31.43 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid A-6 Avalanche Wall

Footing Data

Toe Width	=	3.00 ft
Heel Width	=	7.25
Total Footing Width	=	10.25
Footing Thickness	=	20.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	3,949	256 psf	
Mu' : Upward	=	16,148	18,257 ft-#	
Mu' : Downward	=	1,647	37,914 ft-#	
Mu: Design	=	14,501 OK	19,657 ft-#	OK
phiMn	=	101,027	45,831 ft-#	
Actual 1-Way Shear	=	26.82	20.19 psi	
Allow 1-Way Shear	=	82.16	82.16 psi	
Toe Reinforcing	=	# 9 @ 8.00 in		
Heel Reinforcing	=	# 7 @ 12.00 in		
Key Reinforcing	=	None Spec'd		
Footing Torsion, Tu	=	0.00 ft-lbs		
Footing Allow. Torsion, phi Tu	=	0.00 ft-lbs		

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 5.55 in, #5@ 8.61 in, #6@ 12.22 in, #7@ 16.66 in, #8@ 21.94 in, #9@ 27.77 in, #10@ 35.27 in

Heel: #4@ 5.55 in, #5@ 8.61 in, #6@ 12.22 in, #7@ 16.66 in, #8@ 21.94 in, #9@ 27.77 in, #10@ 35.27 in

Key: No key defined

Min footing T&S reinf Area 4.43 in2
Min footing T&S reinf Area per foot 0.43 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 5.56 in	#4@ 11.11 in
#5@ 8.61 in	#5@ 17.22 in
#6@ 12.22 in	#6@ 24.44 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid A-6 Avalanche Wall

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		3,893.9	4.97	19,361.2	Soil Over HL (ab. water tbl)	8,866.5	7.21	63,912.4
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		7.21	63,912.4
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	40.0	3.58	143.3
Added Lateral Load	=				* Axial Live Load on Stem	=	200.0	3.58	716.7
Load @ Stem Above Soil	=	780.0	19.92	15,535.0	Soil Over Toe	=	165.0	1.50	247.5
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	3,531.3	3.52	12,429.7
					Earth @ Stem Transitions	=	27.5	4.00	110.0
					Footing Weight	=	2,562.5	5.13	13,132.8
					Key Weight	=			
					Vert. Component	=			
Total	=	4,673.9	**O.T.M.** =	34,896.2	**Total =**	15,192.7 lbs	**R.M.=**		89,975.7

Resisting/Overturning Ratio = **2.58**

Vertical Loads used for Soil Pressure = 15,392.7 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.178	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Grid A-6 Avalanche Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 3rd
Stem Design Height: 12.50 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in

---

Stem Design Segment: 2nd
Stem Design Height: 6.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) =	25.63 in
Development length for #6 bar specified in this stem design segment =	19.72 in

---

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

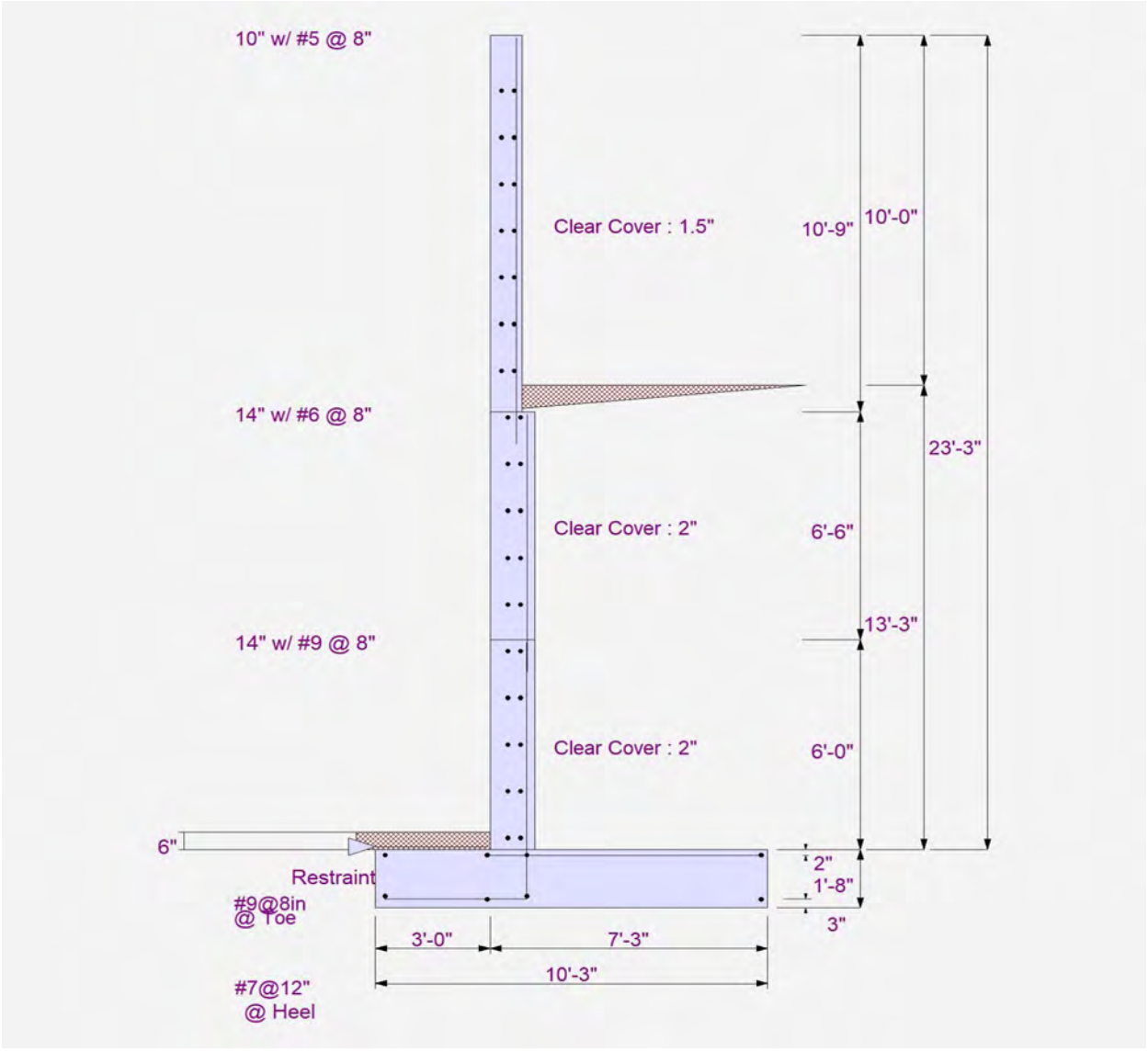
Lap Splice length for #9 bar specified in this stem design segment (25.4.2.3a) =	48.06 in
Development length for #9 bar specified in this stem design segment =	36.97 in
Hooked embedment length into footing for #9 bar specified in this stem design segment =	13.72 in
As Provided =	1.5000 in2/ft
As Required =	1.1926 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

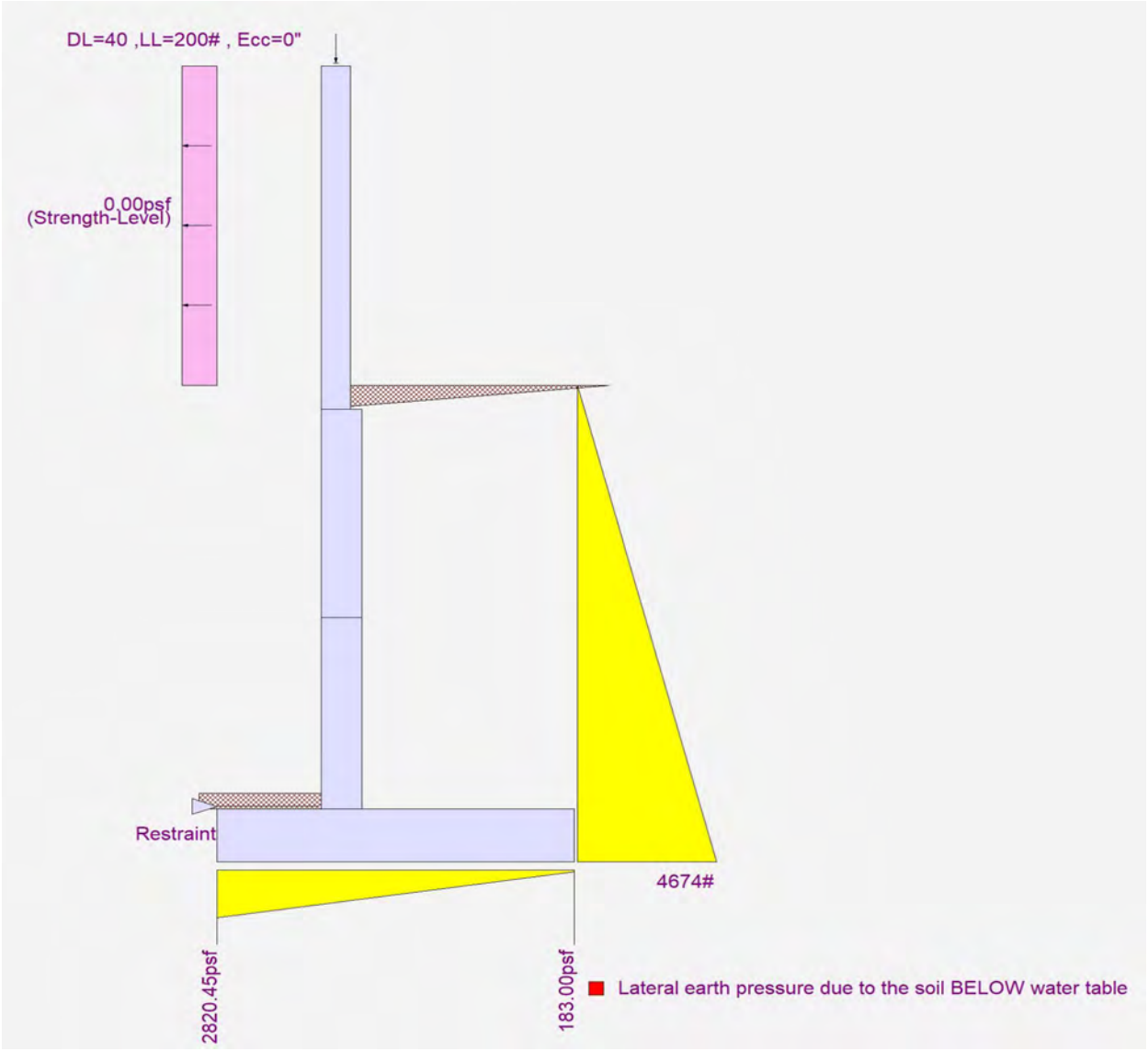
Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid A-6 Avalanche Wall



Cantilevered Retaining Wall

DESCRIPTION: Grid A-6 Avalanche Wall



Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Short Span Deck Joist

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

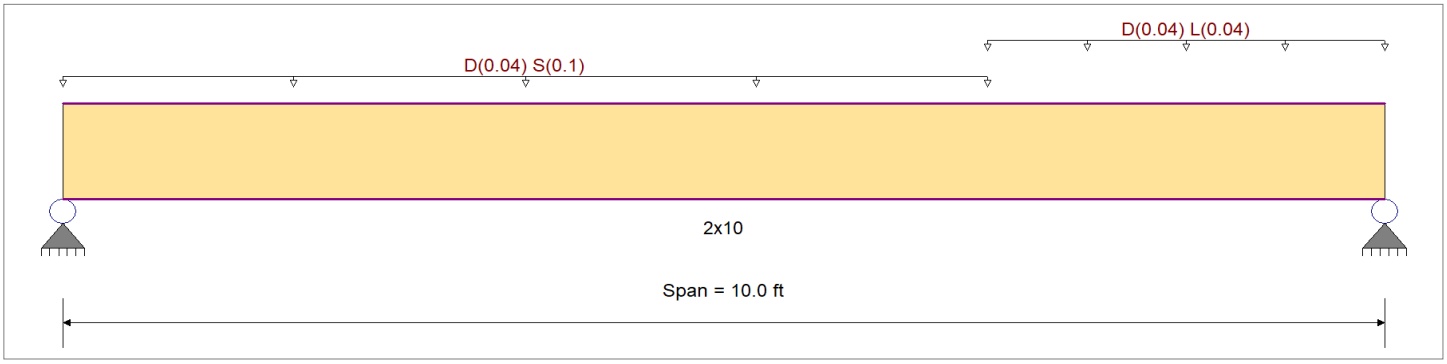
Wood Species : Douglas Fir-Larch (North)
Wood Grade : No. 1/No. 2

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	1,000.0 psi
Fb -	1,000.0 psi
Fc - Prll	1,000.0 psi
Fc - Perp	1,000.0 psi
Fv	65.0 psi
Ft	65.0 psi

E : Modulus of Elasticity

Ebend- xx	1,300.0 ksi
Eminbend - xx	1,300.0 ksi
Density	34.0 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : D = 0.040, S = 0.10 k/ft, Extent = 0.0 -->> 7.0 ft, Tributary Width = 1.0 ft
Uniform Load : D = 0.040, L = 0.040 k/ft, Extent = 7.0 -->> 10.0 ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.680 : 1	Maximum Shear Stress Ratio	=	0.792 : 1
Section used for this span		2x10	Section used for this span		2x10
fb: Actual	=	859.57 psi	fv: Actual	=	59.21 psi
F'b	=	1,265.00 psi	F'v	=	74.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	4.672 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.140 in	Ratio =	854 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.211 in	Ratio =	569 >=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 10.0 ft	1	0.283	0.313	0.90	1.00	1.00	1.00	1.100	1.00	1.00	1.00	0.50	280.5	990.0	0.17	18.3	58.5
+D+L					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.0 ft	1	0.303	0.400	1.00	1.00	1.00	1.00	1.100	1.00	1.00	1.00	0.59	333.3	1,100.0	0.24	26.0	65.0
+D+S					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.0 ft	1	0.680	0.792	1.15	1.00	1.00	1.00	1.100	1.00	1.00	1.00	1.53	859.6	1,265.0	0.55	59.2	74.8
+D+0.750L					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.0 ft	1	0.232	0.297	1.25	1.00	1.00	1.00	1.100	1.00	1.00	1.00	0.57	319.6	1,375.0	0.22	24.1	81.3
+D+0.750L+0.750S					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Short Span Deck Joist

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 10.0 ft	**1**	0.593	0.675	1.15	1.00	1.00	1.00	1.100	1.00	1.00	1.00	1.34	750.6	1,265.0	0.47	50.4	74.8
+0.60D					1.00	1.00	1.00	1.100	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.0 ft	**1**	0.096	0.106	1.60	1.00	1.00	1.00	1.100	1.00	1.00	1.00	0.30	168.3	1,760.0	0.10	11.0	104.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.2108	4.927		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.655	0.460
Max Upward from Load Combinations	0.655	0.460
Max Upward from Load Cases	0.455	0.245
D Only	0.200	0.200
+D+L	0.218	0.302
+D+S	0.655	0.445
+D+0.750L	0.214	0.277
+D+0.750L+0.750S	0.555	0.460
+0.60D	0.120	0.120
L Only	0.018	0.102
S Only	0.455	0.245

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

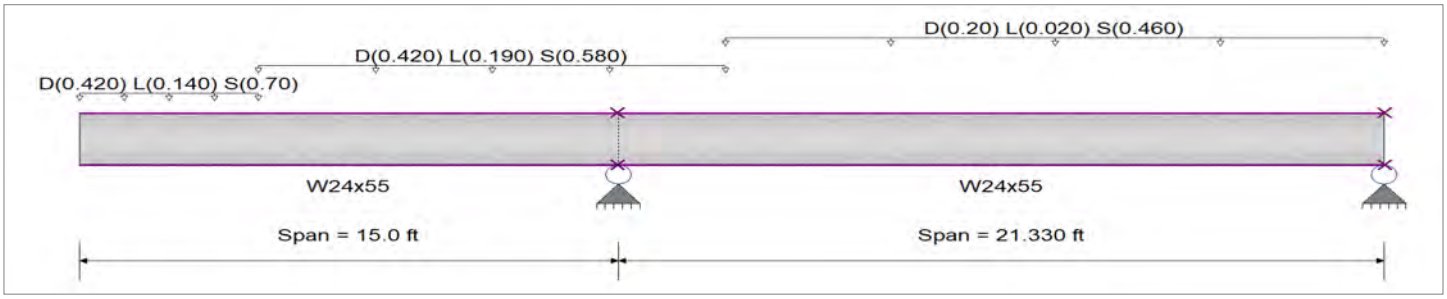
DESCRIPTION: B2-1

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...

Partial Length Uniform Load : D = 0.420, L = 0.140, S = 0.70 k/ft, Extent = 0.0 -->> 5.0 ft

Partial Length Uniform Load : D = 0.420, L = 0.190, S = 0.580 k/ft, Extent = 5.0 -->> 18.0 ft

Partial Length Uniform Load : D = 0.20, L = 0.020, S = 0.460 k/ft, Extent = 18.0 -->> 36.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.359 : 1	Maximum Shear Stress Ratio =	0.093 : 1
Section used for this span	W24x55	Section used for this span	W24x55
Ma : Applied	120.000 k-ft	Va : Applied	15.60 k
Mn / Omega : Allowable	334.331 k-ft	Vn/Omega : Allowable	167.461 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	15.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.402 in	Ratio =	895	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.043 in	Ratio =	6,009	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.685 in	Ratio =	526	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.084 in	Ratio =	3037	>=180	Span: 2 : +D+0.750L+0.750S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 15.00 ft	1	0.141	0.038		-47.25	47.25	558.33	334.33	1.00	1.00	6.30	279.66	167.46
Dsgn. L = 21.33 ft	2	0.141	0.030		-47.25	47.25	558.33	334.33	1.00	1.00	4.96	279.66	167.46
+D+L													
Dsgn. L = 15.00 ft	1	0.196	0.053		-65.50	65.50	558.33	334.33	1.00	1.00	8.90	279.66	167.46
Dsgn. L = 21.33 ft	2	0.196	0.039		-65.50	65.50	558.33	334.33	1.00	1.00	6.50	279.66	167.46
+D+S													
Dsgn. L = 15.00 ft	1	0.359	0.093		-120.00	120.00	558.33	334.33	1.00	1.00	15.60	279.66	167.46
Dsgn. L = 21.33 ft	2	0.359	0.081	1.67	-120.00	120.00	558.33	334.33	1.00	1.00	13.61	279.66	167.46
+D+0.750L													
Dsgn. L = 15.00 ft	1	0.182	0.049		-60.94	60.94	558.33	334.33	1.00	1.00	8.25	279.66	167.46
Dsgn. L = 21.33 ft	2	0.182	0.037		-60.94	60.94	558.33	334.33	1.00	1.00	6.12	279.66	167.46
+D+0.750L+0.750S													
Dsgn. L = 15.00 ft	1	0.345	0.091		-115.50	115.50	558.33	334.33	1.00	1.00	15.23	279.66	167.46
Dsgn. L = 21.33 ft	2	0.345	0.075	0.38	-115.50	115.50	558.33	334.33	1.00	1.00	12.61	279.66	167.46
+0.60D													

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-1

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
Dsgn. L = 15.00 ft	1	0.085	0.023		-28.35	28.35	558.33	334.33	1.00	1.00	3.78	279.66	167.46
Dsgn. L = 21.33 ft	2	0.085	0.018		-28.35	28.35	558.33	334.33	1.00	1.00	2.98	279.66	167.46

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.6846	0.000		0.0000	0.000
	2	0.0000	0.000	+D+0.750L+0.750S	-0.0843	7.679

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions		29.213	1.521	-0.758
Max Upward from Load Combinations		29.213	1.485	-0.758
Max Upward from Load Cases		17.951	1.521	-0.758
Max Downward from all Load Conditions (Resis			-0.642	-0.758
Max Downward from Load Combinations (Resis			-0.642	-0.758
Max Downward from Load Cases (Resisting Up			-0.606	-0.758
D Only		11.262	-0.036	-0.758
+D+L		15.405	-0.642	-0.758
+D+S		29.213	1.485	-0.758
+D+0.750L		14.369	-0.491	-0.758
+D+0.750L+0.750S		27.833	0.650	-0.758
+0.60D		6.757	-0.021	-0.758
L Only		4.143	-0.606	-0.758
S Only		17.951	1.521	-0.758

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-2

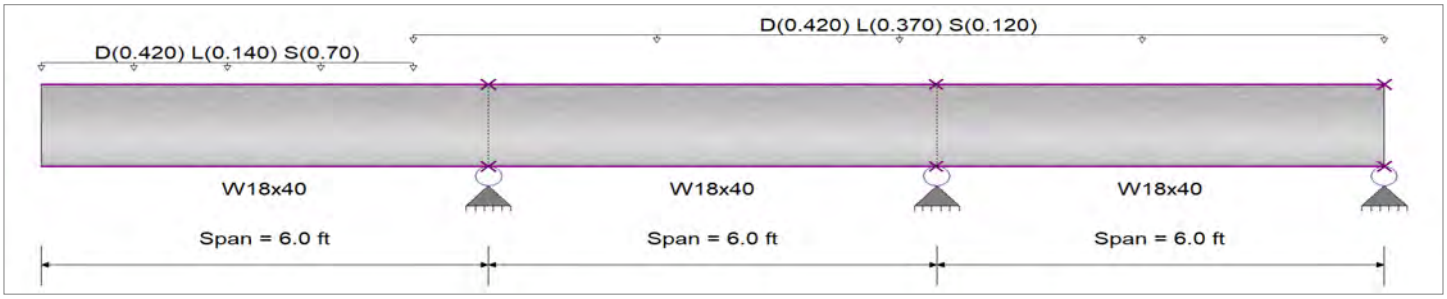
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Partial Length Uniform Load : D = 0.420, L = 0.140, S = 0.70 k/ft, Extent = 0.0 -->> 5.0 ft

Partial Length Uniform Load : D = 0.420, L = 0.370, S = 0.120 k/ft, Extent = 5.0 -->> 18.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.102 : 1	Maximum Shear Stress Ratio =	0.054 : 1
Section used for this span	W18x40	Section used for this span	W18x40
Ma : Applied	19.870 k-ft	Va : Applied	6.140 k
Mn / Omega : Allowable	195.609 k-ft	Vn/Omega : Allowable	112.770 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	6.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.023 in	Ratio =	6,179	>=360	Span: 3 : S Only
Max Upward Transient Deflection	-0.002 in	Ratio =	33,959	>=360	Span: 3 : S Only
Max Downward Total Deflection	0.037 in	Ratio =	3936	>=180	Span: 3 : +D+S
Max Upward Total Deflection	-0.003 in	Ratio =	22605	>=180	Span: 3 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 6.00 ft	1	0.039	0.022		-7.56	7.56	326.67	195.61	1.00	1.00	2.52	169.16 112.77
Dsgn. L = 6.00 ft	2	0.039	0.022	-0.00	-7.56	7.56	326.67	195.61	1.00	1.00	2.52	169.16 112.77
Dsgn. L = 6.00 ft	3	0.010	0.011	1.89	-0.00	1.89	326.67	195.61	1.00	1.00	1.26	169.16 112.77
+D+L												
Dsgn. L = 6.00 ft	1	0.052	0.035		-10.20	10.20	326.67	195.61	1.00	1.00	3.90	169.16 112.77
Dsgn. L = 6.00 ft	2	0.052	0.035	-0.00	-10.20	10.20	326.67	195.61	1.00	1.00	3.90	169.16 112.77
Dsgn. L = 6.00 ft	3	0.016	0.023	3.07	-1.01	3.07	326.67	195.61	1.00	1.00	2.54	169.16 112.77
+D+S												
Dsgn. L = 6.00 ft	1	0.102	0.054		-19.87	19.87	326.67	195.61	1.00	1.00	6.14	169.16 112.77
Dsgn. L = 6.00 ft	2	0.102	0.047	2.54	-19.87	19.87	326.67	195.61	1.00	1.00	5.35	169.16 112.77
Dsgn. L = 6.00 ft	3	0.020	0.018	3.86		3.86	326.67	195.61	1.00	1.00	2.04	169.16 112.77
+D+0.750L												
Dsgn. L = 6.00 ft	1	0.049	0.032		-9.54	9.54	326.67	195.61	1.00	1.00	3.56	169.16 112.77
Dsgn. L = 6.00 ft	2	0.049	0.032	-0.00	-9.54	9.54	326.67	195.61	1.00	1.00	3.56	169.16 112.77
Dsgn. L = 6.00 ft	3	0.014	0.020	2.77	-0.75	2.77	326.67	195.61	1.00	1.00	2.22	169.16 112.77
+D+0.750L+0.750S												
Dsgn. L = 6.00 ft	1	0.096	0.054		-18.77	18.77	326.67	195.61	1.00	1.00	6.04	169.16 112.77
Dsgn. L = 6.00 ft	2	0.096	0.050	1.15	-18.77	18.77	326.67	195.61	1.00	1.00	5.68	169.16 112.77

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-2

Maximum Forces & Stresses for Load Combinations

Load Combination			Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
Segment Length		Span #	M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	VnxVnx/Omega	
Dsgn. L =	6.00 ft	3	0.021	0.023	4.14		4.14	326.67	195.61	1.00	1.00	2.55	169.16	112.77
+0.60D														
Dsgn. L =	6.00 ft	1	0.023	0.013		-4.54	4.54	326.67	195.61	1.00	1.00	1.51	169.16	112.77
Dsgn. L =	6.00 ft	2	0.023	0.013	-0.00	-4.54	4.54	326.67	195.61	1.00	1.00	1.51	169.16	112.77
Dsgn. L =	6.00 ft	3	0.006	0.007	1.13	-0.00	1.13	326.67	195.61	1.00	1.00	0.76	169.16	112.77

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0366	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0032	2.280
+D+0.750L+0.750S	3	0.0016	2.960		0.0000	2.280

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions		11.720	3.376	2.554
Max Upward from Load Combinations		11.720	3.376	2.554
Max Upward from Load Cases		6.455	2.116	1.260
Max Downward from all Load Conditions (Resis			-2.177	
Max Downward from Load Combinations (Resi			-0.917	
Max Downward from Load Cases (Resisting Up			-2.177	
D Only		5.040	1.260	1.260
+D+L		7.491	3.376	2.202
+D+S		11.495	-0.917	2.043
+D+0.750L		6.879	2.847	1.967
+D+0.750L+0.750S		11.720	1.214	2.554
+0.60D		3.024	0.756	0.756
L Only		2.451	2.116	0.942
S Only		6.455	-2.177	0.783

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-3

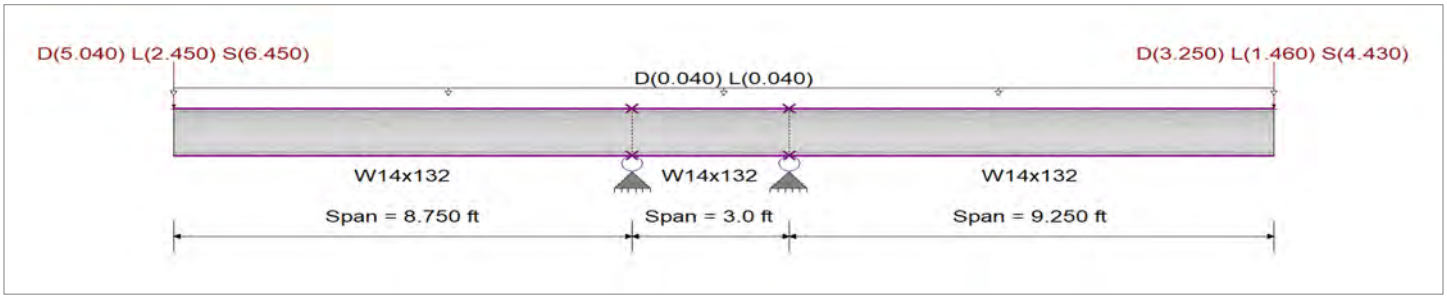
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.040, L = 0.040 k/ft

Load(s) for Span Number 1
Point Load : D = 5.040, L = 2.450, S = 6.450 k @ 0.0 ft

Load(s) for Span Number 3
Point Load : D = 3.250, L = 1.460, S = 4.430 k @ 9.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.189 : 1	Maximum Shear Stress Ratio =	0.071 : 1
Section used for this span	W14x132	Section used for this span	W14x132
Ma : Applied	110.242 k-ft	Va : Applied	13.483 k
Mn / Omega : Allowable	583.832 k-ft	Vn/Omega : Allowable	189.630 k
Load Combination	+D+0.750L+0.750S	Load Combination	+D+0.750L+0.750S
		Location of maximum on span	8.750 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.083 in	Ratio =	2,542	>=360	Span: 3 : S Only
Max Upward Transient Deflection	-0.002 in	Ratio =	16,624	>=360	Span: 3 : S Only
Max Downward Total Deflection	0.159 in	Ratio =	1319	>=180	Span: 3 : +D+0.750L+0.750S
Max Upward Total Deflection	-0.004 in	Ratio =	8549	>=180	Span: 3 : +D+0.750L+0.750S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 8.75 ft	1	0.087	0.035		-50.69	50.69	975.00	583.83	1.00	1.00	6.55	284.45	189.63
Dsgn. L = 3.00 ft	2	0.087	0.026	-0.00	-50.69	50.69	975.00	583.83	1.00	1.00	4.84	284.45	189.63
Dsgn. L = 9.25 ft	3	0.064	0.026		-37.42	37.42	975.00	583.83	1.00	1.00	4.84	284.45	189.63
+D+L												
Dsgn. L = 8.75 ft	1	0.126	0.049		-73.66	73.66	975.00	583.83	1.00	1.00	9.35	284.45	189.63
Dsgn. L = 3.00 ft	2	0.126	0.039	-0.00	-73.66	73.66	975.00	583.83	1.00	1.00	7.32	284.45	189.63
Dsgn. L = 9.25 ft	3	0.090	0.035		-52.64	52.64	975.00	583.83	1.00	1.00	6.67	284.45	189.63
+D+S												
Dsgn. L = 8.75 ft	1	0.183	0.069		-107.12	107.12	975.00	583.83	1.00	1.00	13.00	284.45	189.63
Dsgn. L = 3.00 ft	2	0.183	0.052	-0.00	-107.12	107.12	975.00	583.83	1.00	1.00	9.83	284.45	189.63
Dsgn. L = 9.25 ft	3	0.134	0.049		-78.40	78.40	975.00	583.83	1.00	1.00	9.27	284.45	189.63
+D+0.750L												
Dsgn. L = 8.75 ft	1	0.116	0.046		-67.91	67.91	975.00	583.83	1.00	1.00	8.65	284.45	189.63

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-3

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
Dsgn. L = 3.00 ft	2	0.116	0.035	-0.00	-67.91	67.91	975.00	583.83	1.00	1.00	6.66	284.45	189.63
Dsgn. L = 9.25 ft	3	0.084	0.033		-48.84	48.84	975.00	583.83	1.00	1.00	6.21	284.45	189.63
+D+0.750L+0.750S													
Dsgn. L = 8.75 ft	1	0.189	0.071		-110.24	110.24	975.00	583.83	1.00	1.00	13.48	284.45	189.63
Dsgn. L = 3.00 ft	2	0.189	0.056	-0.00	-110.24	110.24	975.00	583.83	1.00	1.00	10.53	284.45	189.63
Dsgn. L = 9.25 ft	3	0.136	0.050		-79.57	79.57	975.00	583.83	1.00	1.00	9.54	284.45	189.63
+0.60D													
Dsgn. L = 8.75 ft	1	0.052	0.021		-30.41	30.41	975.00	583.83	1.00	1.00	3.93	284.45	189.63
Dsgn. L = 3.00 ft	2	0.052	0.015	-0.00	-30.41	30.41	975.00	583.83	1.00	1.00	2.91	284.45	189.63
Dsgn. L = 9.25 ft	3	0.038	0.015		-22.45	22.45	975.00	583.83	1.00	1.00	2.91	284.45	189.63

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.1592	0.000		0.0000	0.000
	2	0.0000	0.000	+D+0.750L+0.750S	-0.0042	1.460
+D+0.750L+0.750S	3	0.1340	9.250		0.0000	1.460

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions		24.010	0.679	
Max Upward from Load Combinations		24.010	0.407	
Max Upward from Load Cases		11.603	0.679	
Max Downward from all Load Conditions (Resis			-0.723	
Max Downward from Load Combinations (Resi			-0.384	
Max Downward from Load Cases (Resisting Up			-0.723	
D Only		11.225	0.679	
+D+L		16.669	-0.015	
+D+S		22.828	-0.045	
+D+0.750L		15.308	0.158	
+D+0.750L+0.750S		24.010	-0.384	
+0.60D		6.735	0.407	
L Only		5.444	-0.694	
S Only		11.603	-0.723	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-4

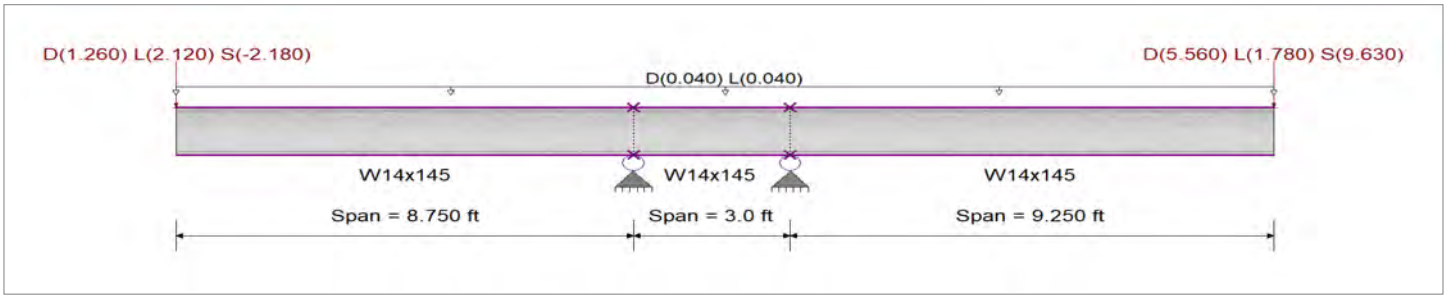
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.040, L = 0.040 k/ft

Load(s) for Span Number 1
Point Load : D = 1.260, L = 2.120, S = -2.180 k @ 0.0 ft

Load(s) for Span Number 3
Point Load : D = 5.560, L = 1.780, S = 9.630 k @ 9.250 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.219 : 1	Maximum Shear Stress Ratio =	0.247 : 1
Section used for this span	W14x145	Section used for this span	W14x145
Ma : Applied	142.219 k-ft	Va : Applied	49.639 k
Mn / Omega : Allowable	648.703 k-ft	Vn/Omega : Allowable	201.280 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	3.000 ft
Span # where maximum occurs	Span # 2	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.114 in	Ratio =	1,952	>=360	Span: 3 : S Only
Max Upward Transient Deflection	-0.010 in	Ratio =	21,245	>=360	Span: 3 : S Only
Max Downward Total Deflection	0.185 in	Ratio =	1200	>=180	Span: 3 : +D+S
Max Upward Total Deflection	-0.003 in	Ratio =	12177	>=180	Span: 3 : +D+0.750L+0.750S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 8.75 ft	1	0.019	0.067		-12.56	12.56	1,083.33	648.70	1.00	1.00	13.47	301.92 201.28
Dsgn. L = 3.00 ft	2	0.082	0.068	-0.00	-53.14	53.14	1,083.33	648.70	1.00	1.00	13.59	301.92 201.28
Dsgn. L = 9.25 ft	3	0.082	0.029		-53.14	53.14	1,083.33	648.70	1.00	1.00	5.93	301.92 201.28
+D+L												
Dsgn. L = 8.75 ft	1	0.050	0.063		-32.64	32.64	1,083.33	648.70	1.00	1.00	12.77	301.92 201.28
Dsgn. L = 3.00 ft	2	0.110	0.065	-0.00	-71.32	71.32	1,083.33	648.70	1.00	1.00	13.01	301.92 201.28
Dsgn. L = 9.25 ft	3	0.110	0.040		-71.32	71.32	1,083.33	648.70	1.00	1.00	8.08	301.92 201.28
+D+S												
Dsgn. L = 8.75 ft	1	0.010	0.246	6.52		6.52	1,083.33	648.70	1.00	1.00	49.52	301.92 201.28
Dsgn. L = 3.00 ft	2	0.219	0.247	6.52	-142.22	142.22	1,083.33	648.70	1.00	1.00	49.64	301.92 201.28
Dsgn. L = 9.25 ft	3	0.219	0.077		-142.22	142.22	1,083.33	648.70	1.00	1.00	15.56	301.92 201.28
+D+0.750L												
Dsgn. L = 8.75 ft	1	0.043	0.064		-27.62	27.62	1,083.33	648.70	1.00	1.00	12.95	301.92 201.28

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-4

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
Dsgn. L = 3.00 ft	2	0.103	0.065	-0.00	-66.77	66.77	1,083.33	648.70	1.00	1.00	13.16	301.92	201.28
Dsgn. L = 9.25 ft	3	0.103	0.037		-66.77	66.77	1,083.33	648.70	1.00	1.00	7.54	301.92	201.28
+D+0.750L+0.750S													
Dsgn. L = 8.75 ft	1	0.021	0.199		-13.31	13.31	1,083.33	648.70	1.00	1.00	39.99	301.92	201.28
Dsgn. L = 3.00 ft	2	0.206	0.200	-0.00	-133.58	133.58	1,083.33	648.70	1.00	1.00	40.20	301.92	201.28
Dsgn. L = 9.25 ft	3	0.206	0.073		-133.58	133.58	1,083.33	648.70	1.00	1.00	14.77	301.92	201.28
+0.60D													
Dsgn. L = 8.75 ft	1	0.012	0.040		-7.53	7.53	1,083.33	648.70	1.00	1.00	8.08	301.92	201.28
Dsgn. L = 3.00 ft	2	0.049	0.041	-0.00	-31.88	31.88	1,083.33	648.70	1.00	1.00	8.15	301.92	201.28
Dsgn. L = 9.25 ft	3	0.049	0.018		-31.88	31.88	1,083.33	648.70	1.00	1.00	3.56	301.92	201.28

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0493	0.000	S Only	-0.0006	8.750
	2	0.0000	0.000	+D+0.750L+0.750S	-0.0030	1.700
+D+S	3	0.1850	9.250		0.0000	1.700

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions		3.165	65.199	
Max Upward from Load Combinations			65.199	
Max Upward from Load Cases		3.165	45.681	
Max Downward from all Load Conditions (Resis		-50.089		
Max Downward from Load Combinations (Resi		-50.089		
Max Downward from Load Cases (Resisting Up		-38.231		
D Only		-11.858	19.518	
+D+L		-8.693	21.093	
+D+S		-50.089	65.199	
+D+0.750L		-9.485	20.700	
+D+0.750L+0.750S		-38.158	54.960	
+0.60D		-7.115	11.711	
L Only		3.165	1.575	
S Only		-38.231	45.681	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-5

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

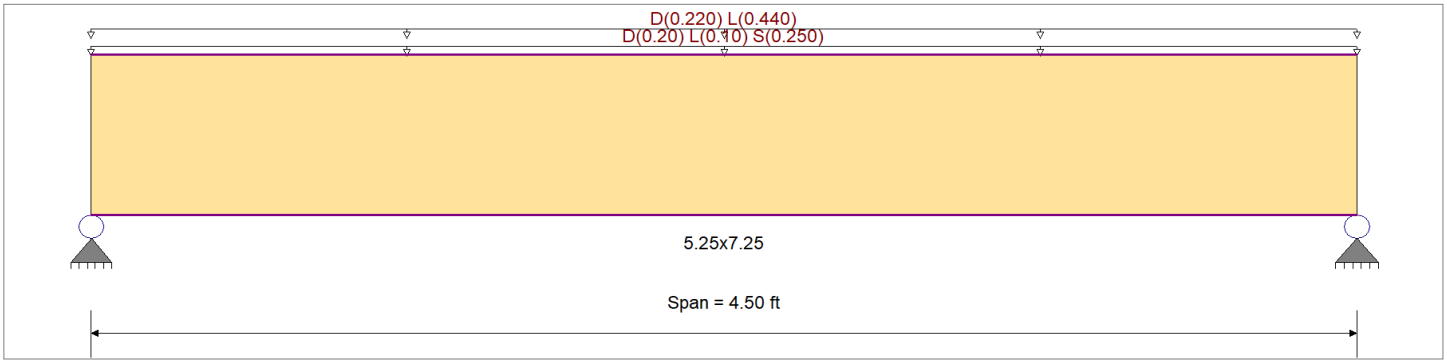
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2800 psi
Fb -	2800 psi
Fc - Prll	3000 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	2100 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	2530120482 ksi
Density	41.76 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.20, L = 0.10, S = 0.250 k/ft
Uniform Load on ALL spans : D = 0.220, L = 0.440 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.214 : 1	Maximum Shear Stress Ratio	=	0.220 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	634.02 psi	fv: Actual	=	62.76 psi
F'b	=	2,961.24 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	2.250 ft	Location of maximum on span	=	3.909 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.015 in	Ratio =	3593 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.028 in	Ratio =	1916 >=180	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 4.50 ft	1	0.104	0.107	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.06	277.4	2,665.1	0.70	27.5	256.5
+D+L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.50 ft	1	0.214	0.220	1.00	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.43	634.0	2,961.2	1.59	62.8	285.0
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.50 ft	1	0.130	0.134	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.70	442.5	3,405.4	1.11	43.8	327.8
+D+0.750L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.50 ft	1	0.147	0.151	1.25	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.09	544.9	3,701.6	1.37	53.9	356.3
+D+0.750L+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-5

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 4.50 ft	**1**	0.196	0.202	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	2.56	668.7	3,405.4	1.68	66.2	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 4.50 ft	**1**	0.035	0.036	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.64	166.4	4,738.0	0.42	16.5	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.0282	2.266		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.278	2.278
Max Upward from Load Combinations	2.278	2.278
Max Upward from Load Cases	1.215	1.215
D Only	0.945	0.945
+D+L	2.160	2.160
+D+S	1.508	1.508
+D+0.750L	1.856	1.856
+D+0.750L+0.750S	2.278	2.278
+0.60D	0.567	0.567
L Only	1.215	1.215
S Only	0.563	0.563

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-6

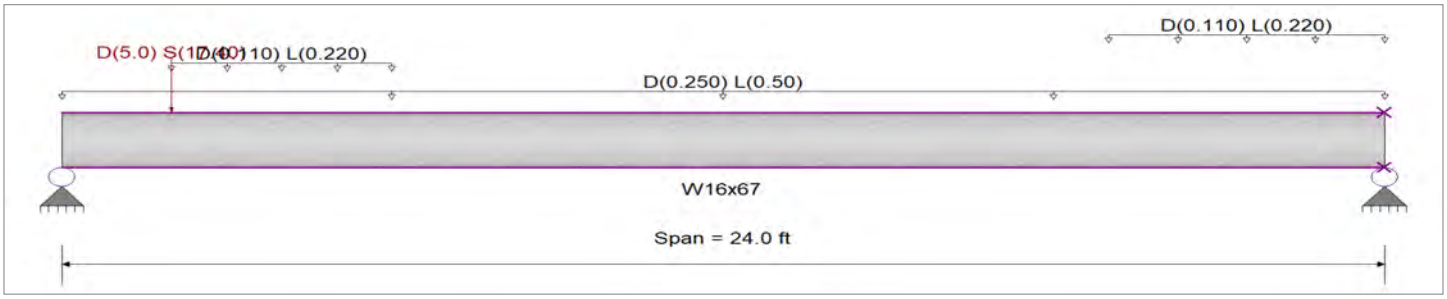
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 12.50 ft, (Top Side Floor Framing)

Uniform Load : D = 0.020, L = 0.040 ksf, Extent = 2.0 -->> 6.0 ft, Tributary Width = 5.50 ft, (Right Side Lower Framing)

Uniform Load : D = 0.020, L = 0.040 ksf, Extent = 19.0 -->> 24.0 ft, Tributary Width = 5.50 ft, (Right Side Lower Framing)

Point Load : D = 5.0, S = 17.40 k @ 2.0 ft, (Post FA)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.227 : 1	Maximum Shear Stress Ratio =	0.201 : 1
Section used for this span	W16x67	Section used for this span	W16x67
Ma : Applied	73.520 k-ft	Va : Applied	25.910 k
Mn / Omega : Allowable	324.351 k-ft	Vn/Omega : Allowable	128.770 k
Load Combination	+D+0.750L+0.750S	Load Combination	+D+0.750L+0.750S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.149 in	Ratio =	1,930	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.286 in	Ratio =	1007	>=180	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 24.00 ft	1	0.092	0.068	29.69		29.69	541.67	324.35	1.00	1.00	8.81	193.16 128.77
+D+L												
Dsgn. L = 24.00 ft	1	0.212	0.122	68.66		68.66	541.67	324.35	1.00	1.00	15.66	193.16 128.77
+D+S												
Dsgn. L = 24.00 ft	1	0.162	0.192	52.39		52.39	541.67	324.35	1.00	1.00	24.76	193.16 128.77
+D+0.750L												
Dsgn. L = 24.00 ft	1	0.182	0.108	58.90		58.90	541.67	324.35	1.00	1.00	13.95	193.16 128.77
+D+0.750L+0.750S												
Dsgn. L = 24.00 ft	1	0.227	0.201	73.52		73.52	541.67	324.35	1.00	1.00	25.91	193.16 128.77
+0.60D												
Dsgn. L = 24.00 ft	1	0.055	0.041	17.81		17.81	541.67	324.35	1.00	1.00	5.29	193.16 128.77

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-6

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.2861	11.520		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	25.910	11.919	45.681
Max Upward from Load Combinations	25.910	11.919	45.681
Max Upward from Load Cases	15.950	7.132	45.681
Max Downward from all Load Conditions (Resis			45.681
Max Downward from Load Combinations (Resi			45.681
Max Downward from Load Cases (Resisting Up			45.681
D Only	8.812	4.787	45.681
+D+L	15.660	11.919	45.681
+D+S	24.762	6.237	45.681
+D+0.750L	13.948	10.136	45.681
+D+0.750L+0.750S	25.910	11.224	45.681
+0.60D	5.287	2.872	45.681
L Only	6.848	7.132	45.681
S Only	15.950	1.450	45.681

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

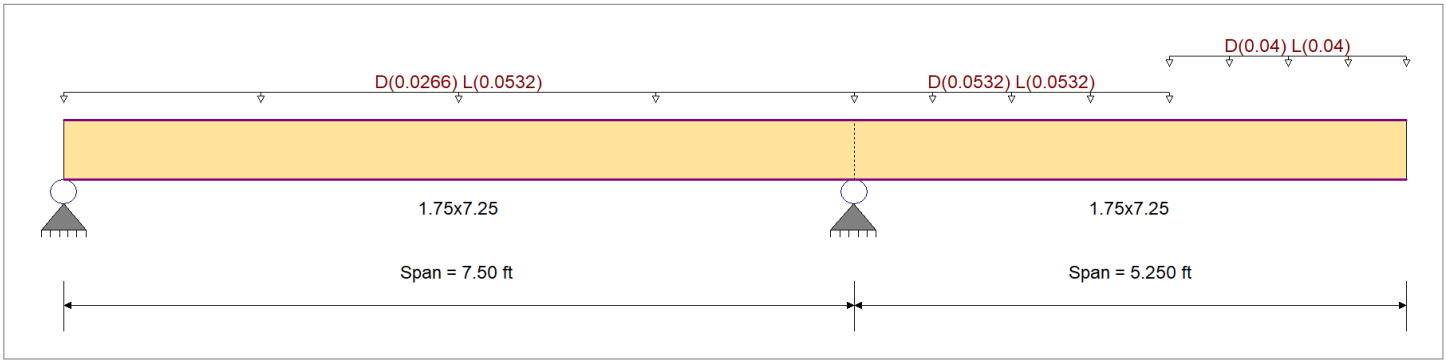
DESCRIPTION: Cantilevered Deck Joist

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	2,800.0 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	2,800.0 psi	Ebend- xx	2,000.0 ksi
		Fc - Prll	3,000.0 psi	Eminbend - xx	1,036.83 ksi
Wood Species :	Boise Cascade	Fc - Perp	750.0 psi		
Wood Grade :	Versa Lam 2800	Fv	285.0 psi		
		Ft	2,100.0 psi	Density	41.760 pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 1.330 ft
Load for Span Number 2
Uniform Load : D = 0.040, L = 0.040 ksf, Extent = 0.0 -->> 3.0 ft, Tributary Width = 1.330 ft
Uniform Load : D = 0.040, L = 0.040 k/ft, Extent = 3.0 -->> 5.250 ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.323 : 1	Maximum Shear Stress Ratio	=	0.181 : 1
Section used for this span		1.75x7.25	Section used for this span		1.75x7.25
fb: Actual	=	955.96 psi	fv: Actual	=	51.64 psi
F'b	=	2,961.24 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	7.500 ft	Location of maximum on span	=	7.500 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.111 in	Ratio =	1132 >=360	Span: 2 : L Only
Max Upward Transient Deflection	-0.005 in	Ratio =	16724 >=360	Span: 1 : L Only
Max Downward Total Deflection	0.261 in	Ratio =	482 >=180	Span: 2 : +D+L
Max Upward Total Deflection	-0.022 in	Ratio =	4063 >=180	Span: 1 : +D+L

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 7.50 ft	1	0.179	0.101	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.61	478.0	2,665.1	0.22	25.8	256.5
Length = 5.250 ft	2	0.179	0.101	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.61	478.0	2,665.1	0.22	25.8	256.5
+D+L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 7.50 ft	1	0.323	0.181	1.00	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.22	956.0	2,961.2	0.44	51.6	285.0
Length = 5.250 ft	2	0.323	0.181	1.00	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.22	956.0	2,961.2	0.44	51.6	285.0
+D+0.750L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Cantilevered Deck Joist

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 7.50 ft	**1**	0.226	0.127	1.25	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.07	836.5	3,701.6	0.38	45.2	356.3
Length = 5.250 ft	**2**	0.226	0.127	1.25	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.07	836.5	3,701.6	0.38	45.2	356.3
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 7.50 ft	**1**	0.061	0.034	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.37	286.8	4,738.0	0.13	15.5	456.0
Length = 5.250 ft	**2**	0.061	0.034	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.37	286.8	4,738.0	0.13	15.5	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+L	-0.0221	5.447
+D+L	2	0.2607	5.250		0.0000	5.447

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.136	0.961	
Max Upward from Load Combinations	0.136	0.961	
Max Upward from Load Cases	0.118	0.531	
D Only	0.018	0.431	
+D+L	0.136	0.961	
+D+0.750L	0.107	0.829	
+0.60D	0.011	0.258	
L Only	0.118	0.531	

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-20

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

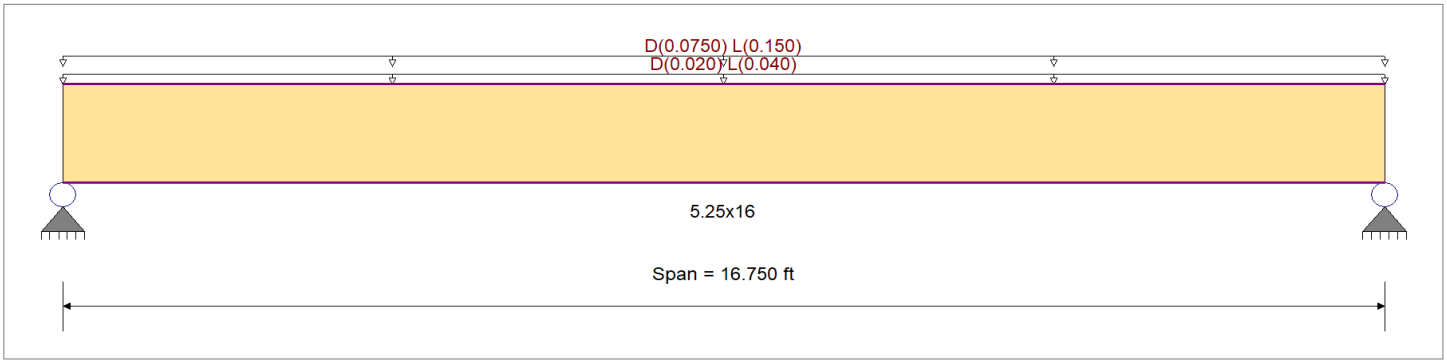
Wood Species : Boise Cascade
Wood Grade : Versa Lam 3100

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	3,100.0 psi
Fb -	3,100.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.020, L = 0.040 k/ft
Partial Length Uniform Load : D = 0.0750, L = 0.150 k/ft, Extent = 0.0 -->> 16.750 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.194 : 1	Maximum Shear Stress Ratio	=	0.137 : 1
Section used for this span		5.25x16	Section used for this span		5.25x16
fb: Actual	=	581.22 psi	fv: Actual	=	39.17 psi
F'b	=	3,002.48 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	8.375 ft	Location of maximum on span	=	15.466 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.094 in	Ratio =	2128 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.154 in	Ratio =	1307 >=180	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.750 ft	1	0.083	0.059	0.90	1.00	1.00	1.00	0.969	1.00	1.00	1.00	4.19	224.2	2,702.2	0.85	15.1	256.5
+D+L					1.00	1.00	1.00	0.969	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.750 ft	1	0.194	0.137	1.00	1.00	1.00	1.00	0.969	1.00	1.00	1.00	10.85	581.2	3,002.5	2.19	39.2	285.0
+D+0.750L					1.00	1.00	1.00	0.969	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.750 ft	1	0.131	0.093	1.25	1.00	1.00	1.00	0.969	1.00	1.00	1.00	9.18	492.0	3,753.1	1.86	33.2	356.3
+0.60D					1.00	1.00	1.00	0.969	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.750 ft	1	0.028	0.020	1.60	1.00	1.00	1.00	0.969	1.00	1.00	1.00	2.51	134.5	4,804.0	0.51	9.1	456.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-20

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1538	8.436		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.591	2.591
Max Upward from Load Combinations	2.591	2.591
Max Upward from Load Cases	1.591	1.591
D Only	1.000	1.000
+D+L	2.591	2.591
+D+0.750L	2.193	2.193
+0.60D	0.600	0.600
L Only	1.591	1.591

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-21

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

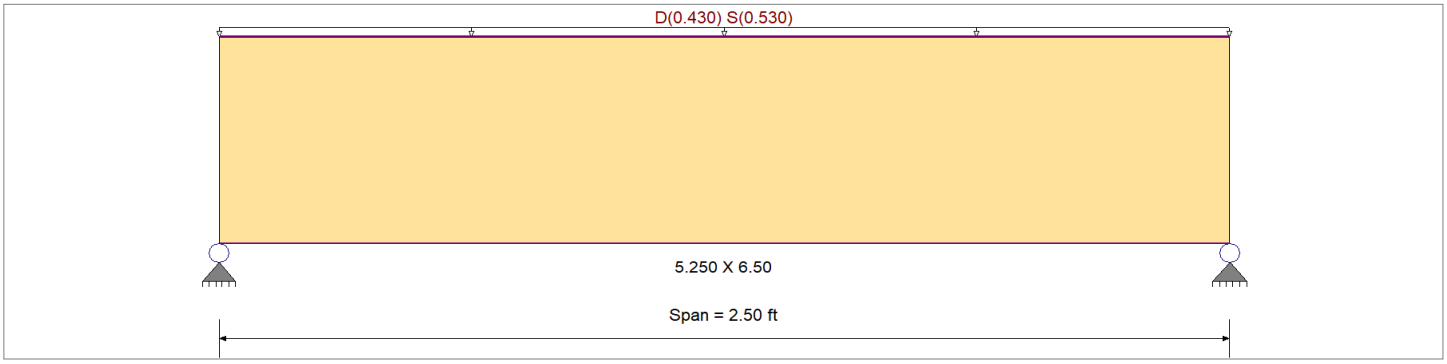
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.430, S = 0.530 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.071 : 1	Maximum Shear Stress Ratio	=	0.092 : 1
Section used for this span		5.250 X 6.50	Section used for this span		5.250 X 6.50
fb: Actual	=	243.45 psi	fv: Actual	=	30.03 psi
F'b	=	3,405.43 psi	F'v	=	327.75 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	1.250 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.002 in	Ratio =	15385	>=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.004 in	Ratio =	8494	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.041	0.052	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.34	109.0	2,665.1	0.31	13.5	256.5
+D+S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.071	0.092	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.75	243.4	3,405.4	0.68	30.0	327.8
+D+0.750S					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.062	0.079	1.15	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.65	209.8	3,405.4	0.59	25.9	327.8
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 2.50 ft	1	0.014	0.018	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.20	65.4	4,738.0	0.18	8.1	456.0

Wood Beam

DESCRIPTION: B2-21

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0035	1.259		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.200	1.200
Max Upward from Load Combinations	1.200	1.200
Max Upward from Load Cases	0.663	0.663
D Only	0.538	0.538
+D+S	1.200	1.200
+D+0.750S	1.034	1.034
+0.60D	0.323	0.323
S Only	0.663	0.663

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-22

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

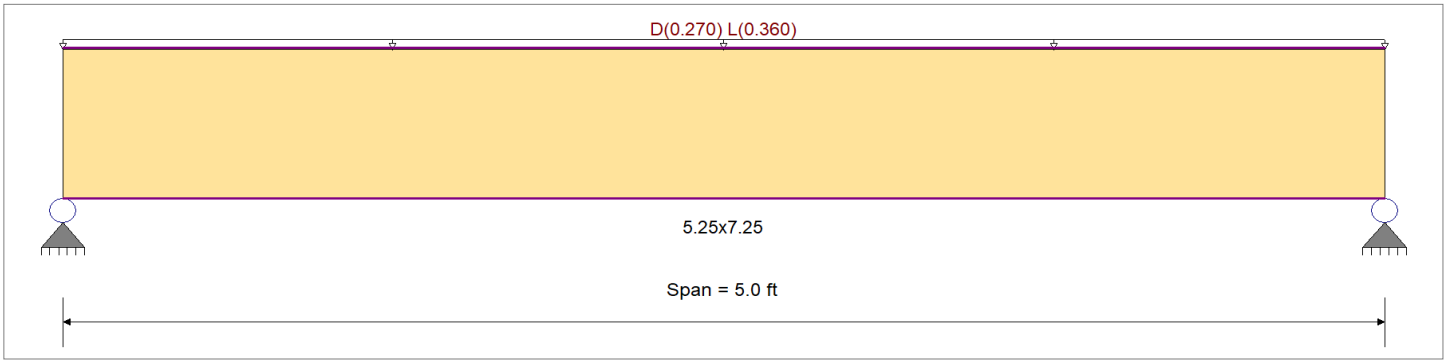
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.030, L = 0.040 ksf, Tributary Width = 9.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.173 : 1	Maximum Shear Stress Ratio	=	0.165 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	513.67 psi	fv: Actual	=	47.12 psi
F'b	=	2,961.24 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	2.500 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.015 in	Ratio =	3928 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.027 in	Ratio =	2245 >=180	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.083	0.079	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.84	220.1	2,665.1	0.51	20.2	256.5
+D+L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.173	0.165	1.00	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.97	513.7	2,961.2	1.20	47.1	285.0
+D+0.750L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.119	0.113	1.25	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.69	440.3	3,701.6	1.02	40.4	356.3
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.028	0.027	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	0.51	132.1	4,738.0	0.31	12.1	456.0

Wood Beam

DESCRIPTION: B2-22

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0267	2.518		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.575	1.575
Max Upward from Load Combinations	1.575	1.575
Max Upward from Load Cases	0.900	0.900
D Only	0.675	0.675
+D+L	1.575	1.575
+D+0.750L	1.350	1.350
+0.60D	0.405	0.405
L Only	0.900	0.900

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-23

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

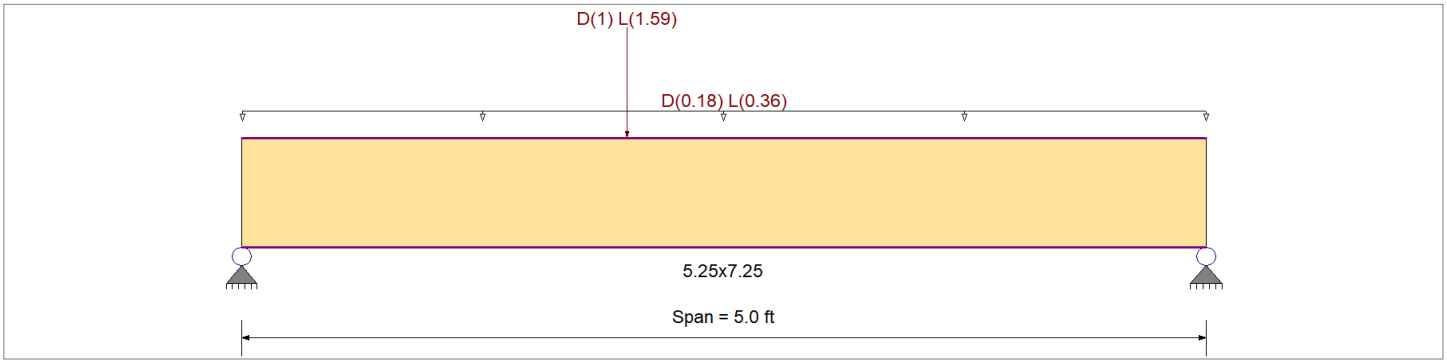
Wood Species : Boise Cascade
Wood Grade : Versa Lam 2800

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,800.0 psi
Fb -	2,800.0 psi
Fc - Prll	3,000.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	2,100.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,036.83 ksi
Density	41.760 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Point Load : D = 1.0, L = 1.590 k @ 2.0 ft
Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 9.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.416 : 1	Maximum Shear Stress Ratio	=	0.357 : 1
Section used for this span		5.25x7.25	Section used for this span		5.25x7.25
fb: Actual	=	1,232.14 psi	fv: Actual	=	101.63 psi
F'b	=	2,961.24 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	2.007 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.036 in	Ratio =	1680 >=360	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.056 in	Ratio =	1067 >=180	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.170	0.145	0.90	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.74	453.4	2,665.1	0.94	37.1	256.5
+D+L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.416	0.357	1.00	1.00	1.00	1.00	1.058	1.00	1.00	1.00	4.72	1,232.1	2,961.2	2.58	101.6	285.0
+D+0.750L					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.280	0.240	1.25	1.00	1.00	1.00	1.058	1.00	1.00	1.00	3.98	1,037.5	3,701.6	2.17	85.5	356.3
+0.60D					1.00	1.00	1.00	1.058	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 5.0 ft	1	0.057	0.049	1.60	1.00	1.00	1.00	1.058	1.00	1.00	1.00	1.04	272.0	4,738.0	0.56	22.3	456.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Wood Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B2-23

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0562	2.427		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.904	2.386
Max Upward from Load Combinations	2.904	2.386
Max Upward from Load Cases	1.854	1.536
D Only	1.050	0.850
+D+L	2.904	2.386
+D+0.750L	2.441	2.002
+0.60D	0.630	0.510
L Only	1.854	1.536

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

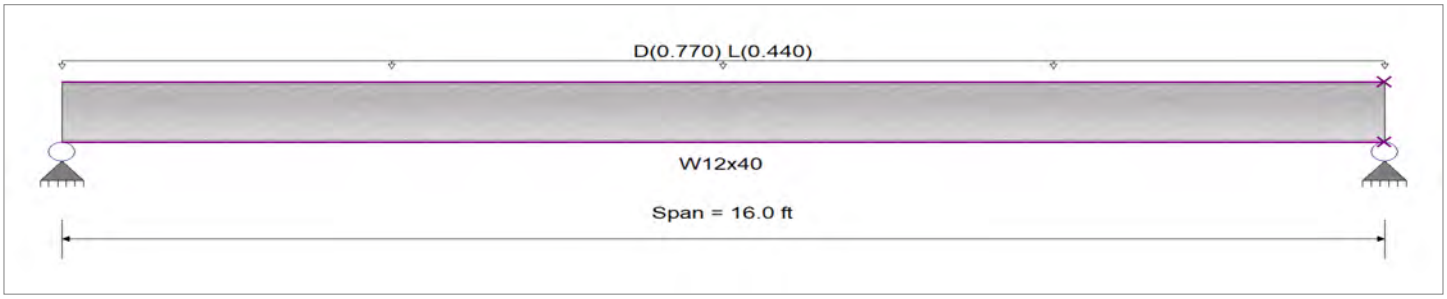
DESCRIPTION: B1-1

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.070, L = 0.040 ksf, Tributary Width = 11.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.272 : 1	Maximum Shear Stress Ratio =	0.138 : 1
Section used for this span	W12x40	Section used for this span	W12x40
Ma : Applied	38.720 k-ft	Va : Applied	9.680 k
Mn / Omega : Allowable	142.216 k-ft	Vn/Omega : Allowable	70.210 k
Load Combination	+D+L	Load Combination	+D+L
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.073 in	Ratio =	2,622	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.201 in	Ratio =	954	>=180	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 16.00 ft	1	0.173	0.088	24.64		24.64	237.50	142.22	1.00	1.00	6.16	105.32 70.21
+D+L												
Dsgn. L = 16.00 ft	1	0.272	0.138	38.72		38.72	237.50	142.22	1.00	1.00	9.68	105.32 70.21
+D+0.750L												
Dsgn. L = 16.00 ft	1	0.248	0.125	35.20		35.20	237.50	142.22	1.00	1.00	8.80	105.32 70.21
+0.60D												
Dsgn. L = 16.00 ft	1	0.104	0.053	14.78		14.78	237.50	142.22	1.00	1.00	3.70	105.32 70.21

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.2013	8.046		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	9.680	9.680	29.171
Max Upward from Load Combinations	9.680	9.680	29.171
Max Upward from Load Cases	6.160	6.160	29.171
Max Downward from all Load Conditions (Resis			29.171
Max Downward from Load Combinations (Resi			29.171
Max Downward from Load Cases (Resisting Up			29.171

Steel Beam

DESCRIPTION: B1-1

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
D Only	6.160	6.160	29.171
+D+L	9.680	9.680	29.171
+D+0.750L	8.800	8.800	29.171
+0.60D	3.696	3.696	29.171
L Only	3.520	3.520	29.171

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

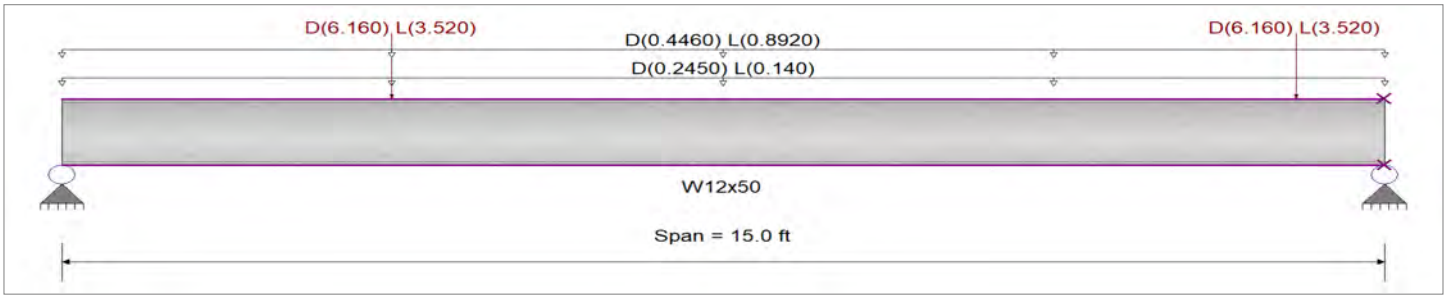
DESCRIPTION: B1-2

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 0.070, L = 0.040 ksf, Tributary Width = 3.50 ft, (PAN DECK)

Point Load : D = 6.160, L = 3.520 k @ 3.750 ft

Point Load : D = 6.160, L = 3.520 k @ 14.0 ft

Uniform Load : D = 0.4460, L = 0.8920 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.403 : 1	Maximum Shear Stress Ratio =	0.270 : 1
Section used for this span	W12x50	Section used for this span	W12x50
Ma : Applied	72.363 k-ft	Va : Applied	24.377 k
Mn / Omega : Allowable	179.391 k-ft	Vn/Omega : Allowable	90.280 k
Load Combination	+D+L	Load Combination	+D+L
		Location of maximum on span	15.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.138 in	Ratio =	1,306	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.266 in	Ratio =	676	>=180	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 15.00 ft	1	0.195	0.138	34.99		34.99	299.58	179.39	1.00	1.00	12.47	135.42 90.28
+D+L												
Dsgn. L = 15.00 ft	1	0.403	0.270	72.36		72.36	299.58	179.39	1.00	1.00	24.38	135.42 90.28
+D+0.750L												
Dsgn. L = 15.00 ft	1	0.351	0.237	62.99		62.99	299.58	179.39	1.00	1.00	21.40	135.42 90.28
+0.60D												
Dsgn. L = 15.00 ft	1	0.117	0.083	20.99		20.99	299.58	179.39	1.00	1.00	7.48	135.42 90.28

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.2664	7.371		0.0000	0.000

Steel Beam

DESCRIPTION: B1-2

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	20.828	24.377	29.171
Max Upward from Load Combinations	20.828	24.377	29.171
Max Upward from Load Cases	10.615	12.472	29.171
Max Downward from all Load Conditions (Resis			29.171
Max Downward from Load Combinations (Resi			29.171
Max Downward from Load Cases (Resisting Up			29.171
D Only	10.213	12.472	29.171
+D+L	20.828	24.377	29.171
+D+0.750L	18.174	21.401	29.171
+0.60D	6.128	7.483	29.171
L Only	10.615	11.905	29.171

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

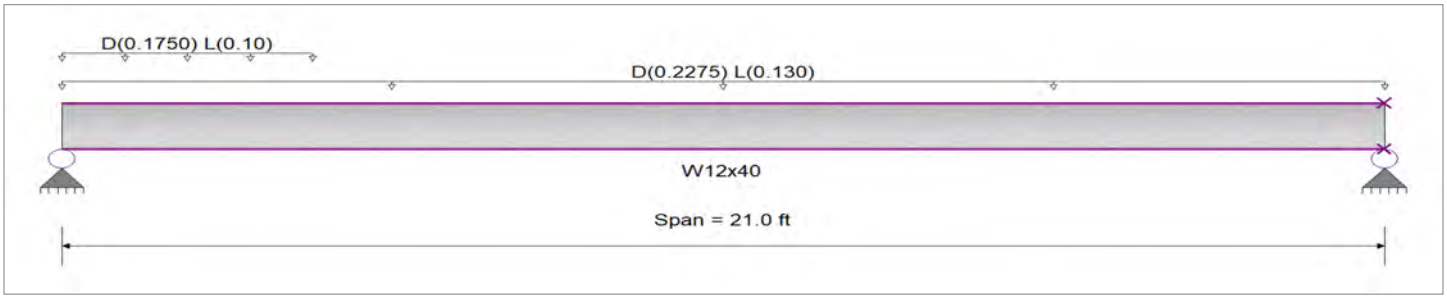
DESCRIPTION: B1-3

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.070, L = 0.040 ksf, Tributary Width = 3.250 ft

Partial Length Uniform Load : D = 0.070, L = 0.040 ksf, Extent = 0.0 -->> 4.0 ft, Tributary Width = 2.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.146 : 1	Maximum Shear Stress Ratio =	0.068 : 1
Section used for this span	W12x40	Section used for this span	W12x40
Ma : Applied	20.823 k-ft	Va : Applied	4.749 k
Mn / Omega : Allowable	142.216 k-ft	Vn/Omega : Allowable	70.210 k
Load Combination	+D+L	Load Combination	+D+L
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.068 in	Ratio =	3,684	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.188 in	Ratio =	1340	>=180	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
D Only													
Dsgn. L = 21.00 ft	1	0.093	0.043	13.25		13.25	237.50	142.22	1.00	1.00	3.02	105.32	70.21
+D+L													
Dsgn. L = 21.00 ft	1	0.146	0.068	20.82		20.82	237.50	142.22	1.00	1.00	4.75	105.32	70.21
+D+0.750L													
Dsgn. L = 21.00 ft	1	0.133	0.061	18.93		18.93	237.50	142.22	1.00	1.00	4.32	105.32	70.21
+0.60D													
Dsgn. L = 21.00 ft	1	0.056	0.026	7.95		7.95	237.50	142.22	1.00	1.00	1.81	105.32	70.21

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1881	10.440		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	4.749	3.859	29.171
Max Upward from Load Combinations	4.749	3.859	29.171
Max Upward from Load Cases	3.022	2.455	29.171
Max Downward from all Load Conditions (Resis			29.171

Steel Beam

DESCRIPTION: B1-3

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Downward from Load Combinations (Resi			29.171
Max Downward from Load Cases (Resisting Up			29.171
D Only	3.022	2.455	29.171
+D+L	4.749	3.859	29.171
+D+0.750L	4.317	3.508	29.171
+0.60D	1.813	1.473	29.171
L Only	1.727	1.403	29.171

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

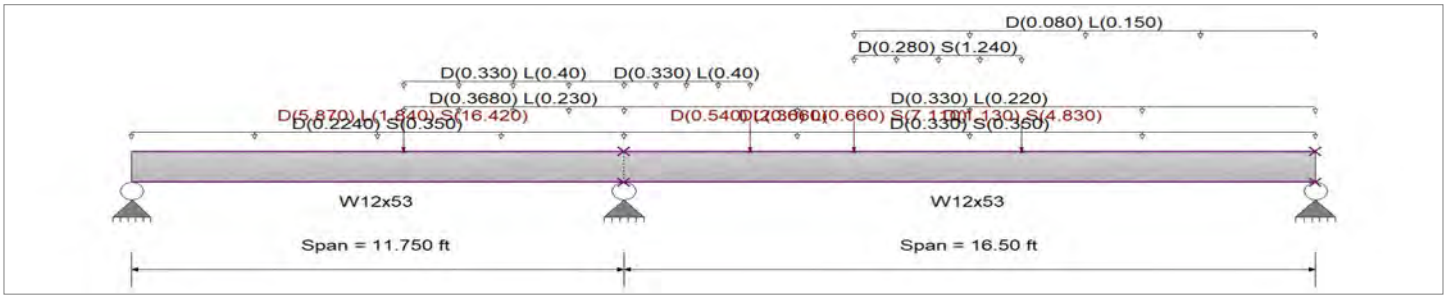
DESCRIPTION: B1-4

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load : D = 0.0640, S = 0.10 ksf, Tributary Width = 3.50 ft, (Green Roof Pan Deck)

Uniform Load : D = 0.0640, L = 0.040 ksf, Extent = 6.50 -->> 11.750 ft, Tributary Width = 5.750 ft, (Interior Pan Deck)

Uniform Load : D = 0.330, L = 0.40 k/ft, Extent = 6.50 -->> 11.750 ft, Tributary Width = 1.0 ft, (Wall Above)

Point Load : D = 5.870, L = 1.840, S = 16.420 k @ 6.50 ft, (B1-5 Point Load)

Load for Span Number 2
Uniform Load : D = 0.330, S = 0.350 k/ft, Tributary Width = 1.0 ft, (Green Roof Pan Deck)

Uniform Load : D = 0.330, L = 0.220 k/ft, Tributary Width = 1.0 ft, (Interior Pan Deck)

Uniform Load : D = 0.330, L = 0.40 k/ft, Extent = 0.0 -->> 3.0 ft, Tributary Width = 1.0 ft, (Wall Above)

Point Load : D = 0.540, L = 0.660 k @ 3.0 ft, (Post FA 1)

Point Load : D = 2.30, L = 0.660, S = 7.110 k @ 5.50 ft, (Post FA 2)

Uniform Load : D = 0.280, S = 1.240 k/ft, Extent = 5.50 -->> 9.50 ft, Tributary Width = 1.0 ft, (Wall FA2)

Point Load : D = 1.130, S = 4.830 k @ 9.50 ft

Uniform Load : D = 0.080, L = 0.150 k/ft, Extent = 5.50 -->> 16.50 ft, Tributary Width = 1.0 ft, (Wall Above)

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-4

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.459 : 1	Maximum Shear Stress Ratio =	0.335 : 1
Section used for this span	W12x53	Section used for this span	W12x53
Ma : Applied	89.251 k-ft	Va : Applied	27.939 k
Mn / Omega : Allowable	194.361 k-ft	Vn/Omega : Allowable	83.490 k
Load Combination	+D+S	Load Combination	+D+0.750L+0.750S
		Location of maximum on span	11.750 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.122 in	Ratio =	1,625	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.003 in	Ratio =	52,001	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.206 in	Ratio =	960	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.007 in	Ratio =	20292	>=180	Span: 2 : +D+0.750L+0.750S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
D Only													
Dsgn. L = 11.75 ft	1	0.178	0.147	7.94	-34.63	34.63	324.58	194.36	1.00	1.00	12.24	125.24	83.49
Dsgn. L = 16.50 ft	2	0.178	0.147	25.97	-34.63	34.63	324.58	194.36	1.00	1.00	12.24	125.24	83.49
+D+L													
Dsgn. L = 11.75 ft	1	0.246	0.209	10.75	-47.87	47.87	324.58	194.36	1.00	1.00	17.48	125.24	83.49
Dsgn. L = 16.50 ft	2	0.246	0.209	34.83	-47.87	47.87	324.58	194.36	1.00	1.00	17.48	125.24	83.49
+D+S													
Dsgn. L = 11.75 ft	1	0.459	0.335	31.35	-89.25	89.25	324.58	194.36	1.00	1.00	27.93	125.24	83.49
Dsgn. L = 16.50 ft	2	0.459	0.335	66.25	-89.25	89.25	324.58	194.36	1.00	1.00	27.93	125.24	83.49
+D+0.750L													
Dsgn. L = 11.75 ft	1	0.229	0.194	10.05	-44.56	44.56	324.58	194.36	1.00	1.00	16.17	125.24	83.49
Dsgn. L = 16.50 ft	2	0.229	0.194	32.61	-44.56	44.56	324.58	194.36	1.00	1.00	16.17	125.24	83.49
+D+0.750L+0.750S													
Dsgn. L = 11.75 ft	1	0.440	0.335	27.60	-85.53	85.53	324.58	194.36	1.00	1.00	27.94	125.24	83.49
Dsgn. L = 16.50 ft	2	0.440	0.335	62.83	-85.53	85.53	324.58	194.36	1.00	1.00	27.94	125.24	83.49
+0.60D													
Dsgn. L = 11.75 ft	1	0.107	0.088	4.76	-20.78	20.78	324.58	194.36	1.00	1.00	7.34	125.24	83.49
Dsgn. L = 16.50 ft	2	0.107	0.088	15.58	-20.78	20.78	324.58	194.36	1.00	1.00	7.34	125.24	83.49

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0302	4.841	+D+0.750L+0.750S	-0.0069	10.528
+D+S	2	0.2063	8.976		0.0000	10.528

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	6.866	54.390	13.644
Max Upward from Load Combinations	6.866	54.390	13.644
Max Upward from Load Cases	4.744	31.481	6.982
D Only	2.122	22.908	6.486
+D+L	2.556	32.861	9.047
+D+S	6.866	54.390	13.468
+D+0.750L	2.448	30.373	8.407
+D+0.750L+0.750S	6.006	53.984	13.644
+0.60D	1.273	13.745	3.891
L Only	0.434	9.952	2.561
S Only	4.744	31.481	6.982

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-5

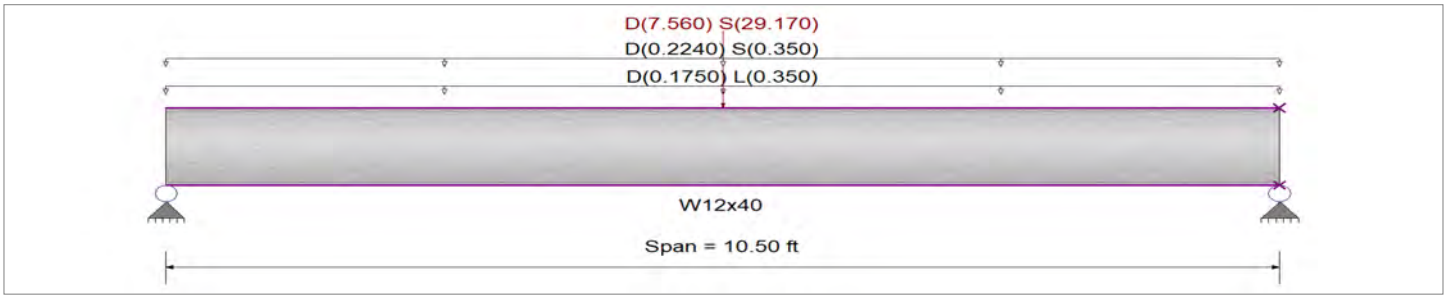
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 8.750 ft, (Floor Above)

Point Load : D = 7.560, S = 29.170 k @ 5.250 ft, (C1)

Uniform Load : D = 0.0640, S = 0.10 ksf, Tributary Width = 3.50 ft, (Pan Deck)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.751 : 1	Maximum Shear Stress Ratio =	0.318 : 1
Section used for this span	W12x40	Section used for this span	W12x40
Ma : Applied	106.738 k-ft	Va : Applied	22.297 k
Mn / Omega : Allowable	142.216 k-ft	Vn/Omega : Allowable	70.210 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.148 in	Ratio =	851	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.196 in	Ratio =	644	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 10.50 ft	1	0.178	0.084	25.34		25.34	237.50	142.22	1.00	1.00	5.87	105.32	70.21
+D+L													
Dsgn. L = 10.50 ft	1	0.212	0.110	30.17		30.17	237.50	142.22	1.00	1.00	7.71	105.32	70.21
+D+S													
Dsgn. L = 10.50 ft	1	0.751	0.318	106.74		106.74	237.50	142.22	1.00	1.00	22.30	105.32	70.21
+D+0.750L													
Dsgn. L = 10.50 ft	1	0.204	0.103	28.96		28.96	237.50	142.22	1.00	1.00	7.25	105.32	70.21
+D+0.750L+0.750S													
Dsgn. L = 10.50 ft	1	0.633	0.279	90.01		90.01	237.50	142.22	1.00	1.00	19.57	105.32	70.21
+0.60D													
Dsgn. L = 10.50 ft	1	0.107	0.050	15.21		15.21	237.50	142.22	1.00	1.00	3.52	105.32	70.21

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1958	5.280		0.0000	0.000

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-5

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	22.297	22.297	6.982
Max Upward from Load Combinations	22.297	22.297	6.982
Max Upward from Load Cases	16.423	16.423	6.982
Max Downward from all Load Conditions (Resis			6.982
Max Downward from Load Combinations (Resi			6.982
Max Downward from Load Cases (Resisting Up			6.982
D Only	5.875	5.875	6.982
+D+L	7.712	7.712	6.982
+D+S	22.297	22.297	6.982
+D+0.750L	7.253	7.253	6.982
+D+0.750L+0.750S	19.570	19.570	6.982
+0.60D	3.525	3.525	6.982
L Only	1.838	1.838	6.982
S Only	16.423	16.423	6.982

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

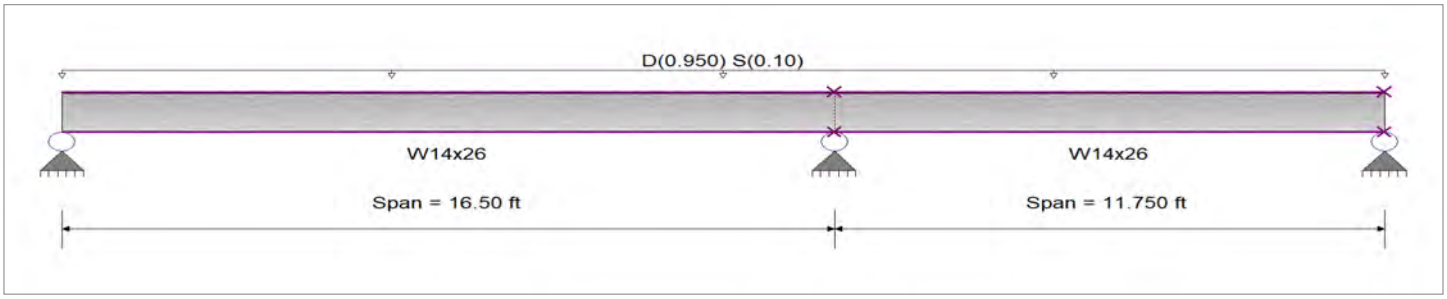
DESCRIPTION: B1-6

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Uniform Load on ALL spans : D = 0.950, S = 0.10 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.283 : 1	Maximum Shear Stress Ratio =	0.146 : 1
Section used for this span	W14x26	Section used for this span	W14x26
Ma : Applied	28.407 k-ft	Va : Applied	10.384 k
Mn / Omega : Allowable	100.299 k-ft	Vn/Omega : Allowable	70.890 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	16.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.013 in	Ratio =	15,754	>=360	Span: 2 : S Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 2 : S Only
Max Downward Total Deflection	0.132 in	Ratio =	1500	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.009 in	Ratio =	16337	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 16.50 ft	1	0.256	0.133	20.76	-25.70	25.70	167.50	100.30	1.00	1.00	9.40	106.34	70.89
Dsgn. L = 11.75 ft	2	0.256	0.110	6.06	-25.70	25.70	167.50	100.30	1.00	1.00	7.77	106.34	70.89
+D+S												
Dsgn. L = 16.50 ft	1	0.283	0.146	22.94	-28.41	28.41	167.50	100.30	1.00	1.00	10.38	106.34	70.89
Dsgn. L = 11.75 ft	2	0.283	0.121	6.70	-28.41	28.41	167.50	100.30	1.00	1.00	8.59	106.34	70.89
+D+0.750S												
Dsgn. L = 16.50 ft	1	0.276	0.143	22.39	-27.73	27.73	167.50	100.30	1.00	1.00	10.14	106.34	70.89
Dsgn. L = 11.75 ft	2	0.276	0.118	6.54	-27.73	27.73	167.50	100.30	1.00	1.00	8.38	106.34	70.89
+0.60D												
Dsgn. L = 16.50 ft	1	0.154	0.080	12.45	-15.42	15.42	167.50	100.30	1.00	1.00	5.64	106.34	70.89
Dsgn. L = 11.75 ft	2	0.154	0.066	3.64	-15.42	15.42	167.50	100.30	1.00	1.00	4.66	106.34	70.89

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1320	7.392		0.0000	0.000
+D+S	2	0.0079	8.272	+D+S	-0.0086	1.974

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	6.941	18.971	3.751

Steel Beam

DESCRIPTION: B1-6

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from Load Combinations	6.941	18.971	3.751
Max Upward from Load Cases	6.280	17.164	3.394
D Only	6.280	17.164	3.394
+D+S	6.941	18.971	3.751
+D+0.750S	6.776	18.519	3.662
+0.60D	3.768	10.298	2.036
S Only	0.661	1.807	0.357

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

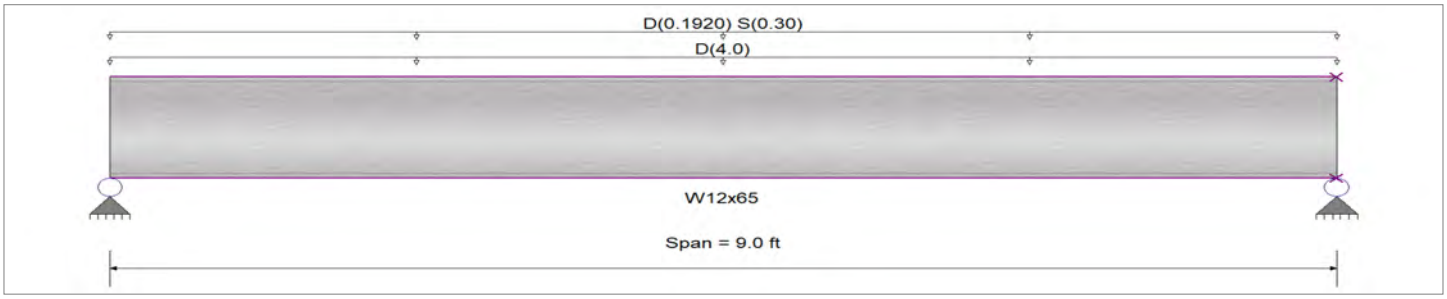
DESCRIPTION: B1-7

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 4.0 k/ft, Tributary Width = 1.0 ft, (CMU + Stone Weight)

Uniform Load : D = 0.0640, S = 0.10 ksf, Tributary Width = 3.0 ft, (Pan Deck Weight)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.192 : 1	Maximum Shear Stress Ratio =	0.214 : 1
Section used for this span	W12x65	Section used for this span	W12x65
Ma : Applied	45.482 k-ft	Va : Applied	20.214 k
Mn / Omega : Allowable	237.004 k-ft	Vn/Omega : Allowable	94.380 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.003 in	Ratio =	37,522	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.043 in	Ratio =	2506	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 9.00 ft	1	0.179	0.200	42.44		42.44	395.80	237.00	1.00	1.00	18.86	141.57 94.38
+D+S												
Dsgn. L = 9.00 ft	1	0.192	0.214	45.48		45.48	395.80	237.00	1.00	1.00	20.21	141.57 94.38
+D+0.750S												
Dsgn. L = 9.00 ft	1	0.189	0.211	44.72		44.72	395.80	237.00	1.00	1.00	19.88	141.57 94.38
+0.60D												
Dsgn. L = 9.00 ft	1	0.107	0.120	25.47		25.47	395.80	237.00	1.00	1.00	11.32	141.57 94.38

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0431	4.526		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	20.214	20.214	0.357
Max Upward from Load Combinations	20.214	20.214	0.357
Max Upward from Load Cases	18.864	18.864	0.357
Max Downward from all Load Conditions (Resis			0.357
Max Downward from Load Combinations (Resi			0.357

Steel Beam

DESCRIPTION: B1-7

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Downward from Load Cases (Resisting Up			0.357
D Only	18.864	18.864	0.357
+D+S	20.214	20.214	0.357
+D+0.750S	19.877	19.877	0.357
+0.60D	11.318	11.318	0.357
S Only	1.350	1.350	0.357

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-8

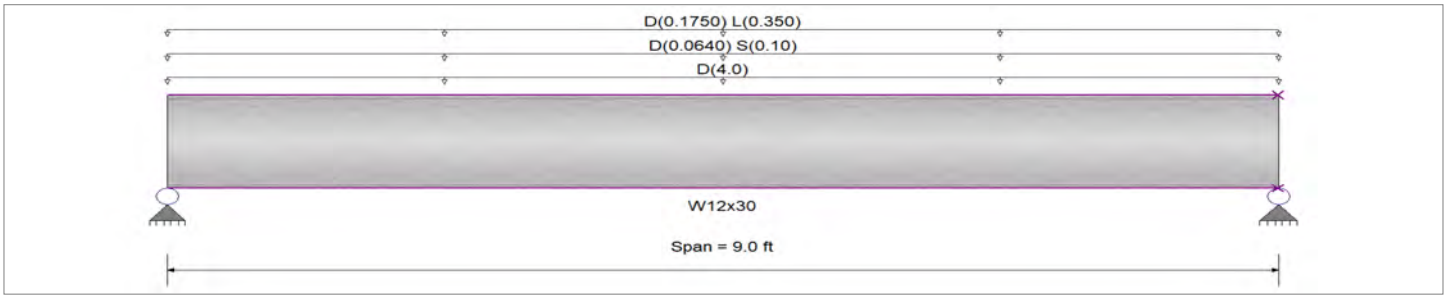
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 4.0 k/ft, Tributary Width = 1.0 ft, (CMU + Stone Weight)

Uniform Load : D = 0.0640, S = 0.10 ksf, Tributary Width = 1.0 ft, (Pan Deck Weight)

Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 8.750 ft, (Floor Above)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.432 : 1	Maximum Shear Stress Ratio =	0.323 : 1
Section used for this span	W12x30	Section used for this span	W12x30
Ma : Applied	46.464 k-ft	Va : Applied	20.651 k
Mn / Omega : Allowable	107.535 k-ft	Vn/Omega : Allowable	63.960 k
Load Combination	+D+L	Load Combination	+D+L
		Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.008 in	Ratio =	14,361	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : L Only
Max Downward Total Deflection	0.099 in	Ratio =	1095	>=180	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 9.00 ft	1	0.399	0.298	42.92		42.92	179.58	107.53	1.00	1.00	19.08	95.94	63.96
+D+L													
Dsgn. L = 9.00 ft	1	0.432	0.323	46.46		46.46	179.58	107.53	1.00	1.00	20.65	95.94	63.96
+D+S													
Dsgn. L = 9.00 ft	1	0.409	0.305	43.93		43.93	179.58	107.53	1.00	1.00	19.53	95.94	63.96
+D+0.750L													
Dsgn. L = 9.00 ft	1	0.424	0.317	45.58		45.58	179.58	107.53	1.00	1.00	20.26	95.94	63.96
+D+0.750L+0.750S													
Dsgn. L = 9.00 ft	1	0.431	0.322	46.34		46.34	179.58	107.53	1.00	1.00	20.59	95.94	63.96
+0.60D													
Dsgn. L = 9.00 ft	1	0.239	0.179	25.75		25.75	179.58	107.53	1.00	1.00	11.45	95.94	63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0986	4.526		0.0000	0.000

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-8

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	20.651	20.651	0.357
Max Upward from Load Combinations	20.651	20.651	0.357
Max Upward from Load Cases	19.076	19.076	0.357
Max Downward from all Load Conditions (Resis			0.357
Max Downward from Load Combinations (Resi			0.357
Max Downward from Load Cases (Resisting Up			0.357
D Only	19.076	19.076	0.357
+D+L	20.651	20.651	0.357
+D+S	19.526	19.526	0.357
+D+0.750L	20.257	20.257	0.357
+D+0.750L+0.750S	20.594	20.594	0.357
+0.60D	11.445	11.445	0.357
L Only	1.575	1.575	0.357
S Only	0.450	0.450	0.357

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-9

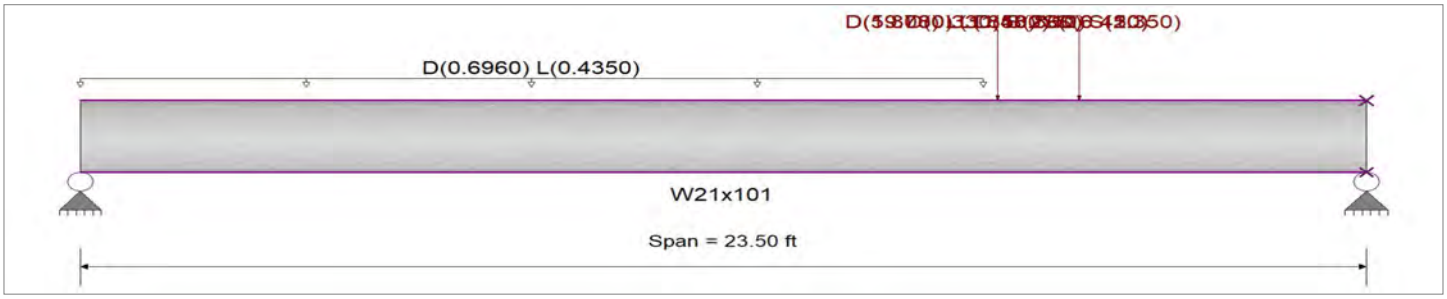
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load : D = 0.0640, L = 0.040 ksf, Extent = 0.0 -->> 16.50 ft, Tributary Width = 10.875 ft, (Pan Deck)

Point Load : D = 0.330, S = 2.10 k @ 16.750 ft, (C1)

Point Load : D = 5.870, L = 1.840, S = 16.420 k @ 16.750 ft, (B1-5)

Point Load : D = 19.080, L = 1.580, S = 0.450 k @ 16.750 ft, (B1-8)

Point Load : D = 18.860, S = 1.350 k @ 18.250 ft, (B1-8)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.510 : 1	Maximum Shear Stress Ratio =	0.245 : 1
Section used for this span	W21x101	Section used for this span	W21x101
Ma : Applied	322.168 k-ft	Va : Applied	52.534 k
Mn / Omega : Allowable	631.238 k-ft	Vn/Omega : Allowable	214.0 k
Load Combination	+D+0.750L+0.750S	Load Combination	+D+0.750L+0.750S
		Location of maximum on span	23.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.104 in	Ratio =	2,704	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.392 in	Ratio =	720	>=180	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	0.000 in	Ratio =	0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 23.50 ft	1	0.356	0.177	224.93		224.93	1,054.17	631.24	1.00	1.00	37.89	321.00 214.00
+D+L												
Dsgn. L = 23.50 ft	1	0.409	0.200	258.44		258.44	1,054.17	631.24	1.00	1.00	42.85	321.00 214.00
+D+S												
Dsgn. L = 23.50 ft	1	0.509	0.245	321.07		321.07	1,054.17	631.24	1.00	1.00	52.46	321.00 214.00
+D+0.750L												
Dsgn. L = 23.50 ft	1	0.396	0.194	250.06		250.06	1,054.17	631.24	1.00	1.00	41.61	321.00 214.00
+D+0.750L+0.750S												
Dsgn. L = 23.50 ft	1	0.510	0.245	322.17		322.17	1,054.17	631.24	1.00	1.00	52.53	321.00 214.00
+0.60D												

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-9

Maximum Forces & Stresses for Load Combinations

Load Combination			Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
Segment Length		Span #	M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L =	23.50 ft	1	0.214	0.106	134.96		134.96	1,054.17	631.24	1.00	1.00	22.73	321.00	214.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.3919	12.690		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	
Max Upward from all Load Conditions	28.662	52.534	0.357
Max Upward from Load Combinations	28.662	52.534	0.357
Max Upward from Load Cases	20.119	37.889	0.357
Max Downward from all Load Conditions (Resis			0.357
Max Downward from Load Combinations (Resi			0.357
Max Downward from Load Cases (Resisting Up			0.357
D Only	20.119	37.889	0.357
+D+L	25.759	42.846	0.357
+D+S	25.869	52.458	0.357
+D+0.750L	24.349	41.607	0.357
+D+0.750L+0.750S	28.662	52.534	0.357
+0.60D	12.071	22.733	0.357
L Only	5.640	4.957	0.357
S Only	5.750	14.570	0.357

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

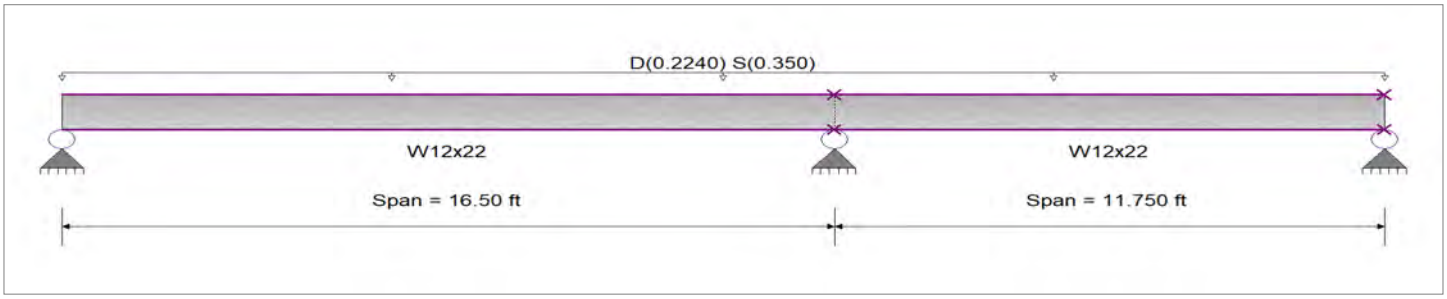
DESCRIPTION: B1-10

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Loads on all spans...
Uniform Load on ALL spans : D = 0.0640, S = 0.10 ksf, Tributary Width = 3.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.221 : 1	Maximum Shear Stress Ratio =	0.092 : 1
Section used for this span	W12x22	Section used for this span	W12x22
Ma : Applied	16.126 k-ft	Va : Applied	5.895 k
Mn / Omega : Allowable	73.104 k-ft	Vn/Omega : Allowable	63.960 k
Load Combination	+D+S	Load Combination	+D+S
		Location of maximum on span	16.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.069 in	Ratio =	2,866	>=360	Span: 2 : S Only
Max Upward Transient Deflection	-0.005 in	Ratio =	31,207	>=360	Span: 2 : S Only
Max Downward Total Deflection	0.118 in	Ratio =	1683	>=180	Span: 2 : +D+S
Max Upward Total Deflection	-0.008 in	Ratio =	18325	>=180	Span: 2 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
D Only												
Dsgn. L = 16.50 ft	1	0.091	0.038	5.38	-6.66	6.66	122.08	73.10	1.00	1.00	2.43	95.94 63.96
Dsgn. L = 11.75 ft	2	0.091	0.031	1.57	-6.66	6.66	122.08	73.10	1.00	1.00	2.01	95.94 63.96
+D+S												
Dsgn. L = 16.50 ft	1	0.221	0.092	13.02	-16.13	16.13	122.08	73.10	1.00	1.00	5.89	95.94 63.96
Dsgn. L = 11.75 ft	2	0.221	0.076	3.80	-16.13	16.13	122.08	73.10	1.00	1.00	4.87	95.94 63.96
+D+0.750S												
Dsgn. L = 16.50 ft	1	0.188	0.079	11.11	-13.76	13.76	122.08	73.10	1.00	1.00	5.03	95.94 63.96
Dsgn. L = 11.75 ft	2	0.188	0.065	3.25	-13.76	13.76	122.08	73.10	1.00	1.00	4.16	95.94 63.96
+0.60D												
Dsgn. L = 16.50 ft	1	0.055	0.023	3.23	-3.99	3.99	122.08	73.10	1.00	1.00	1.46	95.94 63.96
Dsgn. L = 11.75 ft	2	0.055	0.019	0.94	-3.99	3.99	122.08	73.10	1.00	1.00	1.21	95.94 63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.1177	7.392		0.0000	0.000
+D+S	2	0.0070	8.272	+D+S	-0.0077	1.974

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	3.940	10.769	2.129

Steel Beam

DESCRIPTION: B1-10

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from Load Combinations	3.940	10.769	2.129
Max Upward from Load Cases	2.314	6.324	1.250
D Only	1.627	4.446	0.879
+D+S	3.940	10.769	2.129
+D+0.750S	3.362	9.188	1.817
+0.60D	0.976	2.667	0.527
S Only	2.314	6.324	1.250

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

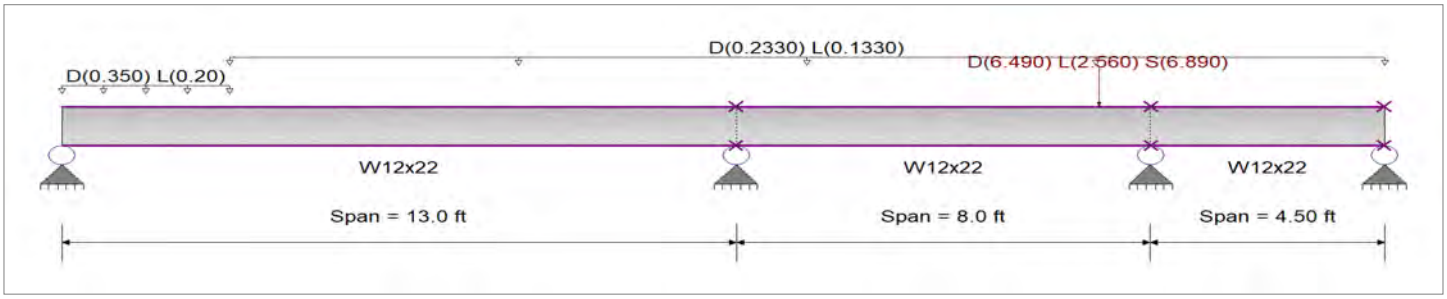
DESCRIPTION: B1-11

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	50.0 ksi
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Loads on all spans...
Partial Length Uniform Load : D = 0.350, L = 0.20 k/ft, Extent = 0.0 -->> 3.250 ft

Partial Length Uniform Load : D = 0.2330, L = 0.1330 k/ft, Extent = 3.250 -->> 25.50 ft

Point Load : D = 6.490, L = 2.560, S = 6.890 k, Starting at : 20.0 ft and placed every 0.0 ft thereafter

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.096 : 1	Maximum Shear Stress Ratio =	0.207 : 1
Section used for this span	W12x22	Section used for this span	W12x22
Ma : Applied	6.991 k-ft	Va : Applied	13.222 k
Mn / Omega : Allowable	73.104 k-ft	Vn/Omega : Allowable	63.960 k
Load Combination	+D+L	Load Combination	+D+0.750L+0.750S
		Location of maximum on span	8.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.011 in	Ratio =	14,636	>=360	Span: 3 : S Only
Max Upward Transient Deflection	-0.002 in	Ratio =	31,352	>=360	Span: 3 : L Only
Max Downward Total Deflection	0.029 in	Ratio =	5453	>=180	Span: 3 : +D+L
Max Upward Total Deflection	-0.003 in	Ratio =	18258	>=180	Span: 3 : +D+S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	Vnx	Vnx/Omega
D Only													
Dsgn. L = 13.00 ft	1	0.062	0.030	3.31	-4.52	4.52	122.08	73.10	1.00	1.00	1.91	95.94	63.96
Dsgn. L = 8.00 ft	2	0.062	0.101	2.98	-4.52	4.52	122.08	73.10	1.00	1.00	6.47	95.94	63.96
Dsgn. L = 4.50 ft	3	0.046	0.020		-3.37	3.37	122.08	73.10	1.00	1.00	1.27	95.94	63.96
+D+L													
Dsgn. L = 13.00 ft	1	0.096	0.047	5.23	-6.99	6.99	122.08	73.10	1.00	1.00	2.99	95.94	63.96
Dsgn. L = 8.00 ft	2	0.096	0.142	4.19	-6.99	6.99	122.08	73.10	1.00	1.00	9.10	95.94	63.96
Dsgn. L = 4.50 ft	3	0.065	0.029		-4.72	4.72	122.08	73.10	1.00	1.00	1.87	95.94	63.96
+D+S													
Dsgn. L = 13.00 ft	1	0.071	0.038	3.07	-5.16	5.16	122.08	73.10	1.00	1.00	2.40	95.94	63.96
Dsgn. L = 8.00 ft	2	0.093	0.201	5.94	-6.78	6.78	122.08	73.10	1.00	1.00	12.84	95.94	63.96
Dsgn. L = 4.50 ft	3	0.093	0.032		-6.78	6.78	122.08	73.10	1.00	1.00	2.03	95.94	63.96
+D+0.750L													
Dsgn. L = 13.00 ft	1	0.087	0.043	4.75	-6.37	6.37	122.08	73.10	1.00	1.00	2.72	95.94	63.96
Dsgn. L = 8.00 ft	2	0.087	0.132	3.89	-6.37	6.37	122.08	73.10	1.00	1.00	8.44	95.94	63.96
Dsgn. L = 4.50 ft	3	0.060	0.027		-4.38	4.38	122.08	73.10	1.00	1.00	1.72	95.94	63.96

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Steel Beam

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: B1-11

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
+D+0.750L+0.750S													
Dsgn. L = 13.00 ft	1	0.094	0.047	4.58	-6.85	6.85	122.08	73.10	1.00	1.00	3.02	95.94	63.96
Dsgn. L = 8.00 ft	2	0.095	0.207	6.10	-6.94	6.94	122.08	73.10	1.00	1.00	13.22	95.94	63.96
Dsgn. L = 4.50 ft	3	0.095	0.036		-6.94	6.94	122.08	73.10	1.00	1.00	2.29	95.94	63.96
+0.60D													
Dsgn. L = 13.00 ft	1	0.037	0.018	1.98	-2.71	2.71	122.08	73.10	1.00	1.00	1.15	95.94	63.96
Dsgn. L = 8.00 ft	2	0.037	0.061	1.79	-2.71	2.71	122.08	73.10	1.00	1.00	3.88	95.94	63.96
Dsgn. L = 4.50 ft	3	0.028	0.012		-2.02	2.02	122.08	73.10	1.00	1.00	0.76	95.94	63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.0286	5.720		0.0000	0.000
+D+S	2	0.0073	5.120	+D+L	-0.0009	0.747
	3	0.0000	5.120	+D+S	-0.0030	1.860

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	2.365	5.870	15.514	
Max Upward from Load Combinations	2.365	5.870	15.514	
Max Upward from Load Cases	1.500	3.797	7.739	
Max Downward from all Load Conditions (Resis	-0.049			-0.982
Max Downward from Load Combinations (Resis				-0.982
Max Downward from Load Cases (Resisting Up	-0.049			-0.758
D Only	1.500	3.797	7.739	-0.224
+D+L	2.365	5.870	10.972	-0.226
+D+S	1.450	4.361	14.872	-0.982
+D+0.750L	2.148	5.352	10.164	-0.225
+D+0.750L+0.750S	2.111	5.775	15.514	-0.794
+0.60D	0.900	2.278	4.644	-0.134
L Only	0.865	2.074	3.233	-0.002
S Only	-0.049	0.564	7.133	-0.758

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining/Green Roof

Code Reference

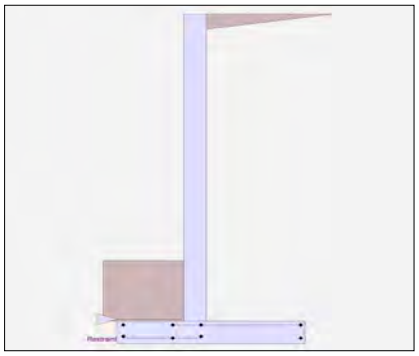
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	13.50 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	32.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	250.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Strength Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	280.0 lbs
Axial Live Load	=	350.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining/Green Roof

Design Summary

Wall Stability Ratios

Overturning	=	2.16	OK
Slab Resists All Sliding !			
Global Stability	=	1.84	

Total Bearing Load	=	9,546 lbs	
...resultant ecc.	=	14.72 in	
Eccentricity outside middle third			
Soil Pressure @ Toe	=	2,799 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	4,000 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	3,919 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	48.4 psi	OK
Footing Shear @ Heel	=	32.5 psi	OK
Allowable	=	106.1 psi	

Sliding Calcs

Lateral Sliding Force	=	3,679.4 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		Bottom				
		Ratio > 1.0				
Design Height Above Ftg	ft =	0.00				
Wall Material Above "Ht"	=	Concrete				
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00				
Rebar Size	=	# 6				
Rebar Spacing	=	12.00				
Rebar Placed at	=	Edge				

Design Data

fb/FB + fa/Fa	=	**1.574**
Total Force @ Section		
Service Level	lbs =	
Strength Level	lbs =	5,103.0
Moment....Actual		
Service Level	ft-# =	
Strength Level	ft-# =	22,963.5
Moment.....Allowable	=	14,583.5
Shear.....Actual		
Service Level	psi =	
Strength Level	psi =	55.8
Shear.....Allowable	psi =	106.1
Anet (Masonry)	in2 =	
Wall Weight	psf =	125.0
Rebar Depth 'd'	in =	7.63

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	5,000.0
Fy	psi =	60,000.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining/Green Roof

Concrete Stem Rebar Area Details

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.6967 in2/ft		
(4/3) * As :	0.9289 in2/ft	Min Stem T&S Reinf Area 3.240 in2	
3sqrt(f'c)bd/fy : 3sqrt(5000)(12)(7.625)/6000	0.3235 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.6967 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.44 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.9444 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	2.50 ft
Heel Width	=	4.50
Total Footing Width	=	7.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 5,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe		Heel	
Factored Pressure	=	3,919		0	psf
Mu' : Upward	=	10,751		4,059	ft-#
Mu' : Downward	=	1,663		13,189	ft-#
Mu: Design	=	9,089	OK	9,130	ft-# OK
phiMn	=	28,565		12,513	ft-#
Actual 1-Way Shear	=	48.39		32.47	psi
Allow 1-Way Shear	=	106.07		106.07	psi

Toe Reinforcing = # 8 @ 12.00 in
Heel Reinforcing = # 6 @ 17.95 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 7.30 in, #5@ 11.32 in, #6@ 16.07 in, #7@ 21.92 in, #8@ 28.86 in, #9@ 36.54 in, #10@ 46.40 in

Heel: #4@ 8.16 in, #5@ 12.65 in, #6@ 17.95 in, #7@ 24.48 in, #8@ 32.23 in, #9@ 40.81 in, #10@ 51.82 in

Key: No key defined

Min footing T&S reinf Area	1.81	in2
Min footing T&S reinf Area per foot	0.26	in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining/Green Roof

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		3,679.4	4.83	17,783.6	Soil Over HL (ab. water tbl)	5,445.0	5.17	28,132.5
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		5.17	28,132.5
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	280.0	2.92	816.7
Added Lateral Load	=				* Axial Live Load on Stem	=	350.0	2.92	1,020.8
Load @ Stem Above Soil	=				Soil Over Toe	=	733.3	1.25	916.7
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,687.5	2.92	4,921.9
					Earth @ Stem Transitions	=			
					Footing Weight	=	1,050.0	3.50	3,675.0
					Key Weight	=			
					Vert. Component	=			
Total	=	3,679.4	**O.T.M.** =	17,783.6	**Total =**		9,195.8 lbs	**R.M.=**	38,462.7

Resisting/Overturning Ratio = **2.16**
Vertical Loads used for Soil Pressure = 9,545.8 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.150	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Garage Retaining/Green Roof

Rebar Lap & Embedment Lengths Information

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

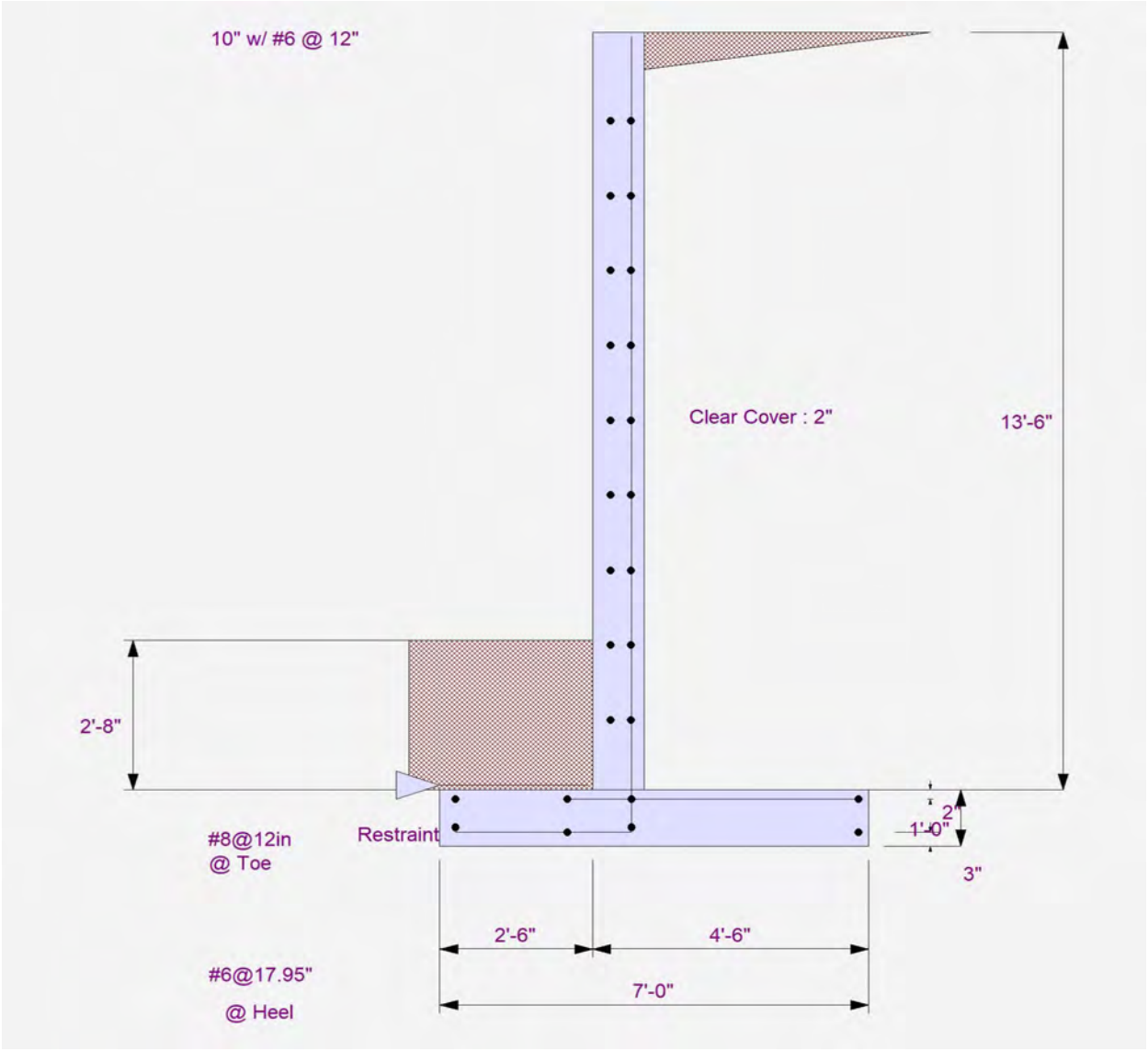
Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) =	19.86 in
Development length for #6 bar specified in this stem design segment =	15.27 in
Hooked embedment length into footing for #6 bar specified in this stem design segment =	8.91 in
As Provided =	0.4400 in2/ft
As Required =	0.6967 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining/Green Roof



Cantilevered Retaining Wall

DESCRIPTION: Garage Retaining/Green Roof

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid E

Code Reference

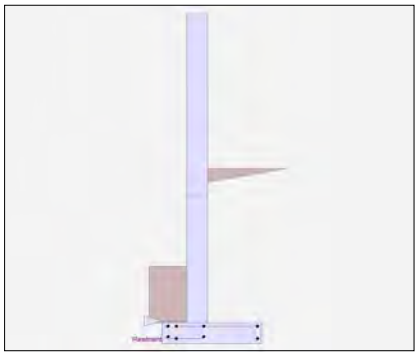
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	7.33 ft
Wall height above soil	=	7.33 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	32.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	400.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



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	=	0.3 lbs
Axial Live Load	=	0.4 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Strength Level)	=	16.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid E

Design Summary

Wall Stability Ratios

Overturning	=	2.14	OK
Slab Resists All Sliding !			
Global Stability	=	1.46	

Total Bearing Load	=	4,473 lbs	
...resultant ecc.	=	11.06 in	
Eccentricity outside middle third			
Soil Pressure @ Toe	=	2,766 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	4,000 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	3,872 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	8.7 psi	OK
Footing Shear @ Heel	=	11.5 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	1,284.7 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		2nd	Bottom			
		Stem OK	Stem OK			
Design Height Above Ftg	ft =	6.00	0.00			
Wall Material Above "Ht"	=	Concrete	Concrete			
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00	10.00			
Rebar Size	=	# 5	# 5			
Rebar Spacing	=	16.00	16.00			
Rebar Placed at	=	Edge	Edge			
Design Data						
fb/FB + fa/Fa	=	**0.115**	**0.689**			
Total Force @ Section						
Service Level	lbs =					
Strength Level	lbs =	237.2	1,692.1			
Moment....Actual						
Service Level	ft-# =					
Strength Level	ft-# =	959.3	5,739.0			
Moment.....Allowable	ft-# =	8,327.0	8,327.0			
Shear.....Actual						
Service Level	psi =					
Strength Level	psi =	2.4	17.2			
Shear.....Allowable	psi =	82.2	82.2			
Anet (Masonry)	in2 =					
Wall Weight	psf =	125.0	125.0			
Rebar Depth 'd'	in =	8.19	8.19			

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid E

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0271 in2/ft		
(4/3) * As :	0.0361 in2/ft	Min Stem T&S Reinf Area 2.078 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.216 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.2325 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1621 in2/ft		
(4/3) * As :	0.2161 in2/ft	Min Stem T&S Reinf Area 1.440 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.2161 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.2325 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	1.00 ft
Heel Width	=	3.00
Total Footing Width	=	4.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	3,872	0	psf
Mu' : Upward	=	1,737	549	ft-#
Mu' : Downward	=	266	2,694	ft-#
Mu: Design	=	1,471 OK	2,145	ft-# OK
phiMn	=	27,464	24,231	ft-#
Actual 1-Way Shear	=	8.72	11.50	psi
Allow 1-Way Shear	=	82.16	82.16	psi

Toe Reinforcing = # 8 @ 12.00 in
Heel Reinforcing = # 7 @ 12.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area 1.04 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid E

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		1,214.3	2.78	3,371.7	Soil Over HL (ab. water tbl)	1,747.0	2.92	5,095.4
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		2.92	5,095.4
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	0.3	1.42	0.4
Added Lateral Load	=				* Axial Live Load on Stem	=	0.4	1.42	0.5
Load @ Stem Above Soil	=	70.4	12.00	844.1	Soil Over Toe	=	293.3	0.50	146.7
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,832.5	1.42	2,596.0
					Earth @ Stem Transitions	=			
					Footing Weight	=	600.0	2.00	1,200.0
					Key Weight	=			
					Vert. Component	=			
Total	=	1,284.7	**O.T.M.** =	4,215.8	**Total =**		4,473.1 lbs	**R.M.=**	9,038.5

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Resisting/Overturning Ratio = **2.14**

Vertical Loads used for Soil Pressure = 4,473.4 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.282	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Garage Retaining Grid E

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 6.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in

---

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

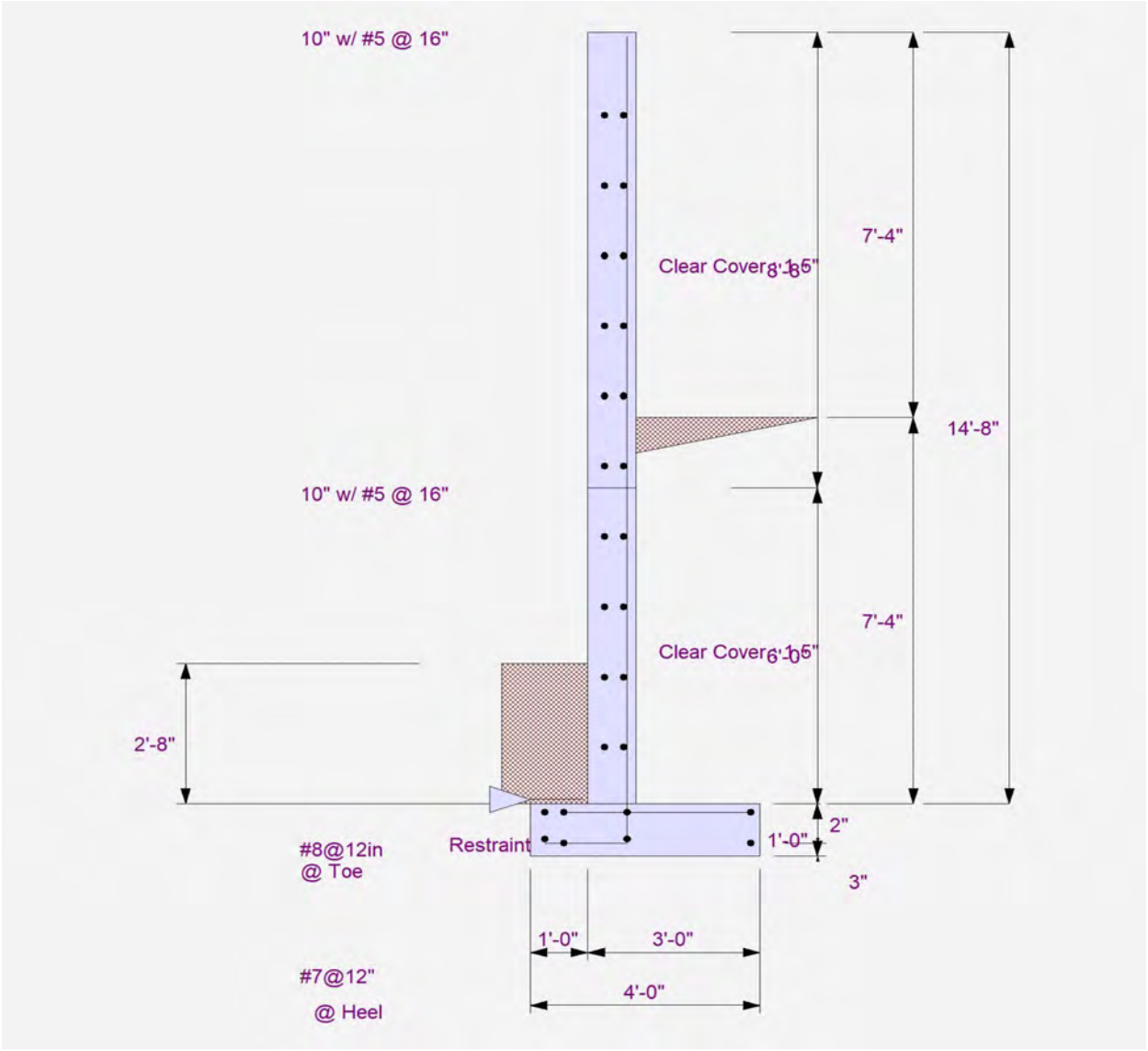
Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in
Hooked embedment length into footing for #5 bar specified in this stem design segment =	8.91 in
As Provided =	0.2325 in2/ft
As Required =	0.2161 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

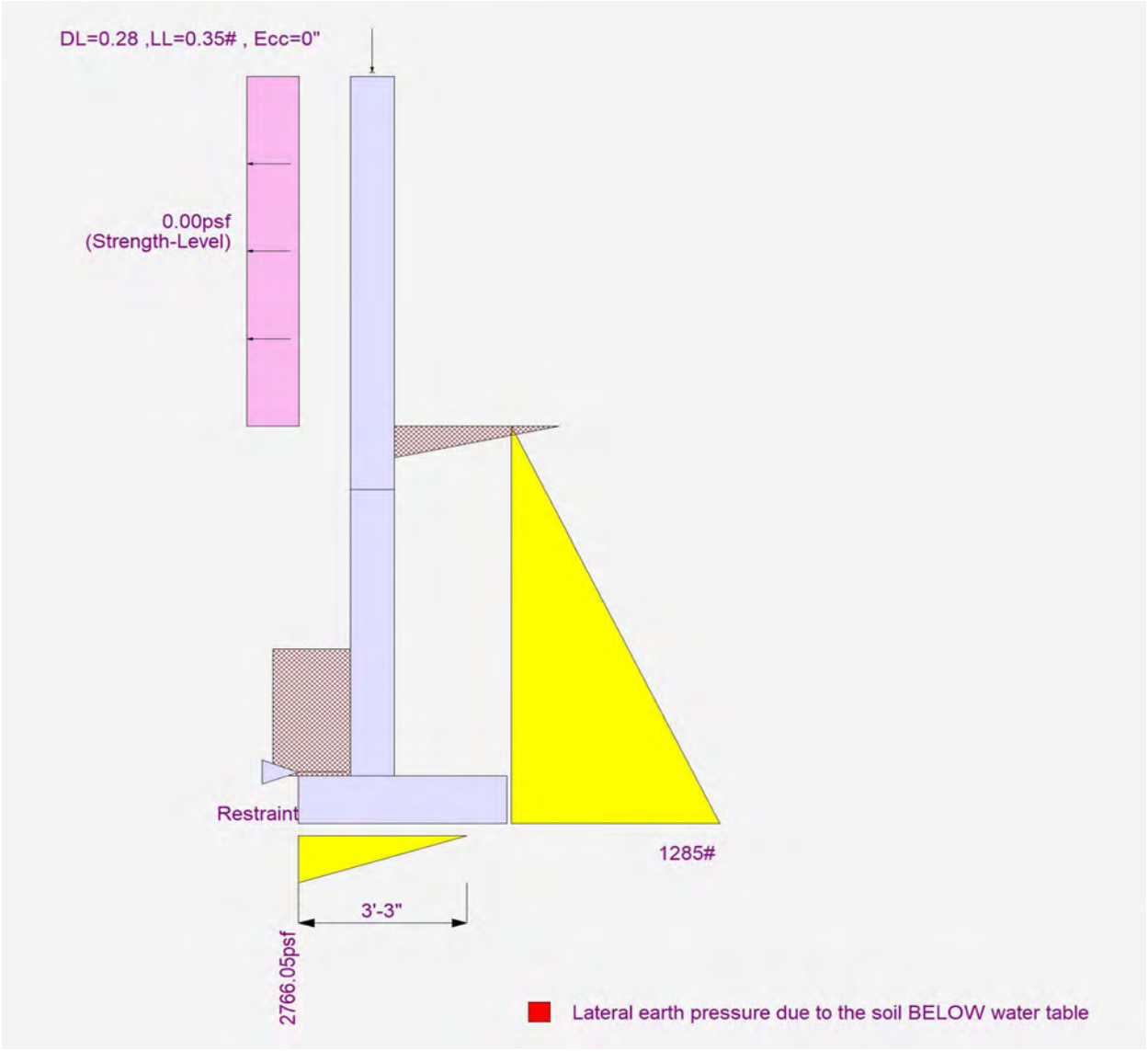
Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid E



Cantilevered Retaining Wall

DESCRIPTION: Garage Retaining Grid E



Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B

Code Reference

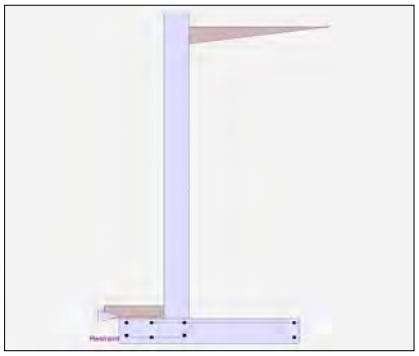
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	11.50 ft
Wall height above soil	=	0.50 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	400.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Strength Level)	=	16.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	0.5 lbs
Axial Live Load	=	1.9 lbs
Axial Load Eccentricity	=	0.0 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B

Design Summary

Wall Stability Ratios

Overturning	=	2.18	OK
Slab Resists All Sliding !			
Global Stability	=	1.97	

Total Bearing Load	=	7,123	lbs
...resultant ecc.	=	13.23	in
Eccentricity outside middle third			
Soil Pressure @ Toe	=	2,503	psf OK
Soil Pressure @ Heel	=	0	psf OK
Allowable	=	4,000	psf
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	3,504	psf
ACI Factored @ Heel	=	0	psf
Footing Shear @ Toe	=	23.2	psi OK
Footing Shear @ Heel	=	24.2	psi OK
Allowable	=	82.2	psi

Sliding Calcs

Lateral Sliding Force	=	2,739.2	lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		2nd	Bottom			
		Stem OK	Stem OK			
Design Height Above Ftg	ft =	5.00	0.00			
Wall Material Above "Ht"	=	Concrete	Concrete			
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00	10.00			
Rebar Size	=	# 5	# 5			
Rebar Spacing	=	16.00	8.00			
Rebar Placed at	=	Edge	Edge			
Design Data						
fb/FB + fa/Fa	=	**0.318**	**0.886**			
Total Force @ Section						
Service Level	lbs =					
Strength Level	lbs =	1,195.8	3,715.8			
Moment....Actual						
Service Level	ft-# =					
Strength Level	ft-# =	2,649.6	14,345.2			
Moment.....Allowable	ft-# =	8,327.0	16,175.5			
Shear.....Actual						
Service Level	psi =					
Strength Level	psi =	12.2	37.8			
Shear.....Allowable	psi =	82.2	82.2			
Anet (Masonry)	in2 =					
Wall Weight	psf =	125.0	125.0			
Rebar Depth 'd'	in =	8.19	8.19			

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0748 in2/ft		
(4/3) * As :	0.0998 in2/ft	Min Stem T&S Reinf Area 1.680 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.216 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.2325 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.4051 in2/ft		
(4/3) * As :	0.5402 in2/ft	Min Stem T&S Reinf Area 1.200 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.4051 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.465 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	1.50 ft
Heel Width	=	4.50
Total Footing Width	=	6.00
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	3,504	0	psf
Mu' : Upward	=	3,596	3,886	ft-#
Mu' : Downward	=	277	11,414	ft-#
Mu: Design	=	3,319 OK	7,529	ft-# OK
phiMn	=	17,225	24,231	ft-#
Actual 1-Way Shear	=	23.23	24.16	psi
Allow 1-Way Shear	=	82.16	82.16	psi

Toe Reinforcing = # 5 @ 8.00 in
Heel Reinforcing = # 7 @ 12.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area 1.56 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		2,734.4	4.17	11,393.2	Soil Over HL (ab. water tbl)	4,638.3	4.17	19,326.4
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		4.17	19,326.4
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	0.5	1.92	1.0
Added Lateral Load	=				* Axial Live Load on Stem	=	1.9	1.92	3.6
Load @ Stem Above Soil	=	4.8	12.75	61.2	Soil Over Toe	=	82.5	0.75	61.9
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,500.0	1.92	2,875.0
					Earth @ Stem Transitions	=			
					Footing Weight	=	900.0	3.00	2,700.0
					Key Weight	=			
					Vert. Component	=			
Total	=	2,739.2	**O.T.M.** =	11,454.4	**Total =**		7,121.3 lbs	**R.M.=**	24,964.2

Resisting/Overturning Ratio = **2.18**
Vertical Loads used for Soil Pressure = 7,123.2 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.139	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Garage Retaining Grid B

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 5.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in

---

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

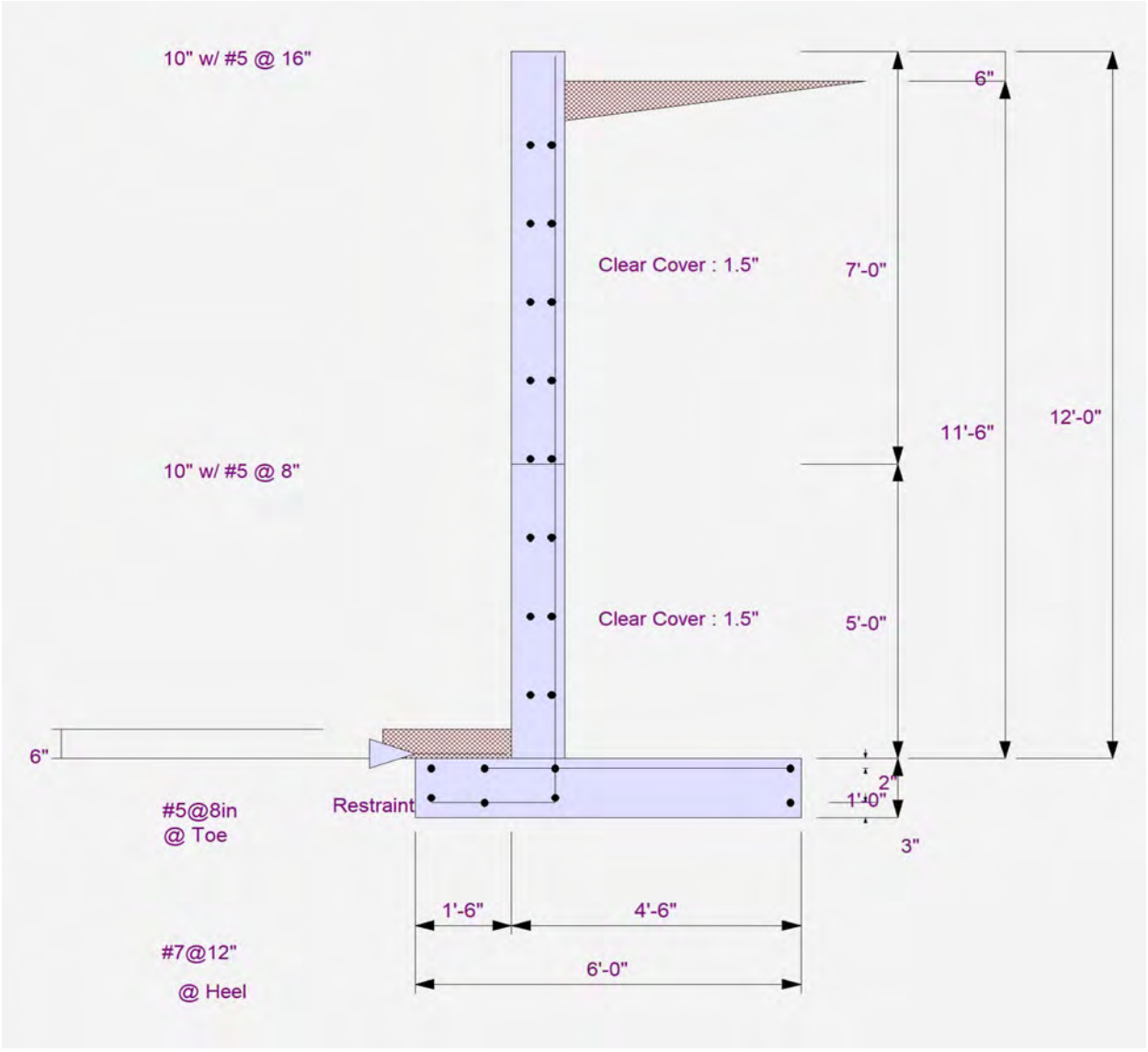
Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in
Hooked embedment length into footing for #5 bar specified in this stem design segment =	8.35 in
As Provided =	0.4650 in2/ft
As Required =	0.4051 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B

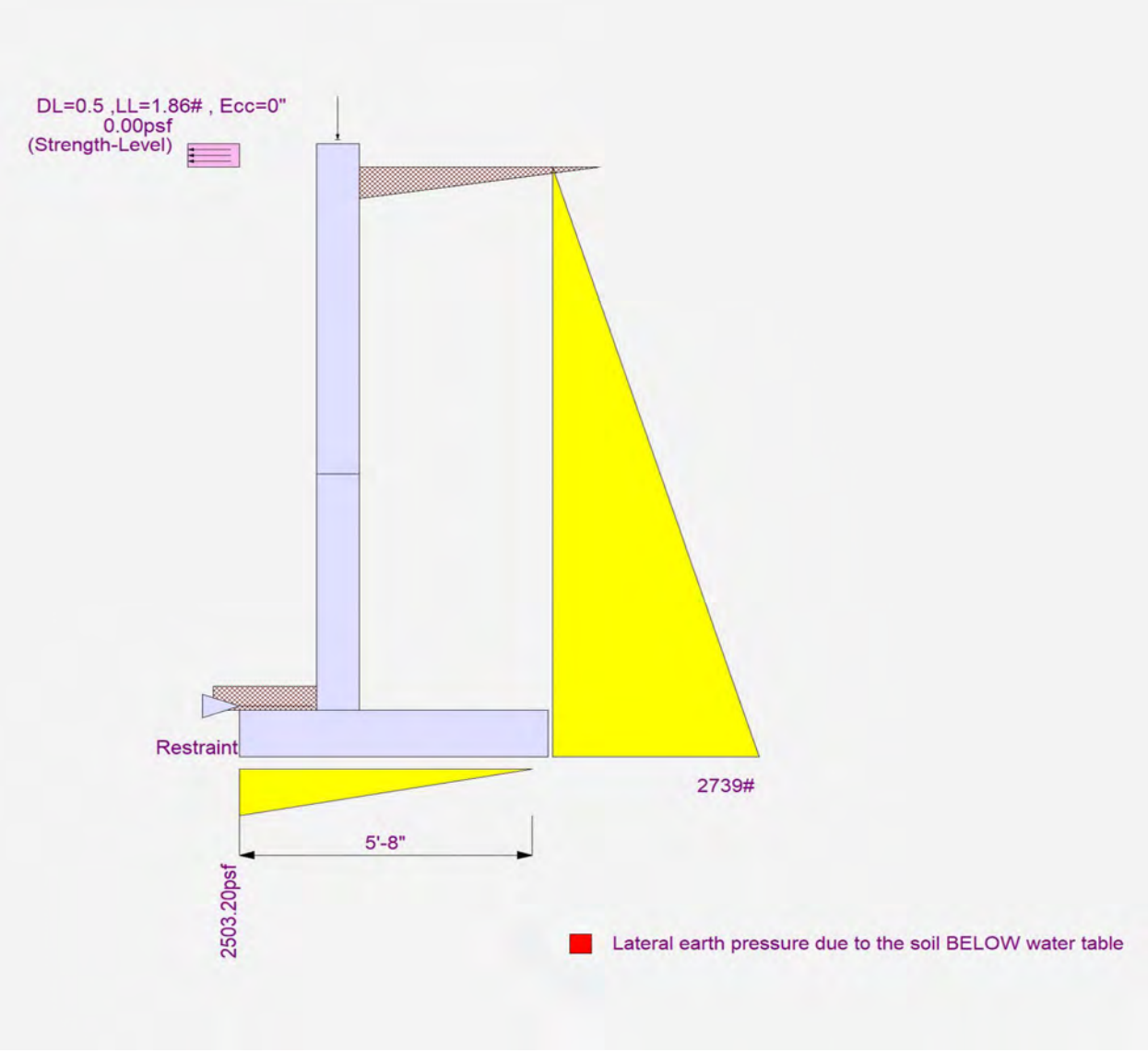


Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Garage Retaining Grid B



Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall

Code Reference

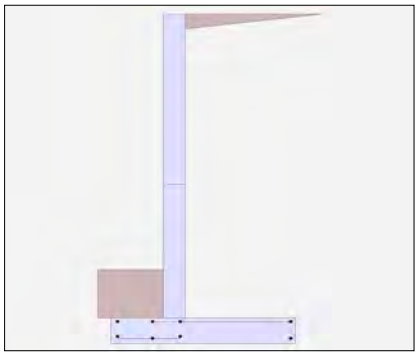
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	13.67 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	26.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	400.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



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	=	75.0 lbs
Axial Live Load	=	0.0 lbs
Axial Load Eccentricity	=	0.0 in

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Strength Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall

Design Summary

Wall Stability Ratios

Overturning	=	2.09	OK
Sliding	=	1.54	OK
Global Stability	=	2.16	

Total Bearing Load	=	9,751 lbs	
...resultant ecc.	=	16.37 in	
Eccentricity outside middle third			
Soil Pressure @ Toe	=	3,043 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	4,000 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	4,261 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	29.4 psi	OK
Footing Shear @ Heel	=	30.0 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	3,852.2 lbs	
less 100% Passive Force	-	2,022.2 lbs	
less 100% Friction Force	-	3,900.3 lbs	
Added Force Req'd	=	0.0 lbs	OK
....for 1.5 Stability	=	0.0 lbs	OK

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		2nd	Bottom			
		Stem OK	Stem OK			
Design Height Above Ftg	ft =	6.00	0.00			
Wall Material Above "Ht"	=	Concrete	Concrete			
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00	10.00			
Rebar Size	=	# 6	# 7			
Rebar Spacing	=	16.00	8.00			
Rebar Placed at	=	Edge	Edge			
Design Data						
fb/FB + fa/Fa	=	**0.388**	**0.881**			
Total Force @ Section						
Service Level	lbs =					
Strength Level	lbs =	1,647.2	5,232.3			
Moment....Actual						
Service Level	ft-# =					
Strength Level	ft-# =	4,211.4	23,842.0			
Moment.....Allowable	ft-# =	10,841.2	27,043.9			
Shear.....Actual						
Service Level	psi =					
Strength Level	psi =	18.0	57.7			
Shear.....Allowable	psi =	82.2	82.2			
Anet (Masonry)	in2 =					
Wall Weight	psf =	125.0	125.0			
Rebar Depth 'd'	in =	7.63	7.56			

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.1281 in2/ft		
(4/3) * As :	0.1708 in2/ft	Min Stem T&S Reinf Area 1.841 in2	
200bd/fy : 200(12)(7.625)/60000 :	0.305 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.216 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.33 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.2395 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.7314 in2/ft		
(4/3) * As :	0.9752 in2/ft	Min Stem T&S Reinf Area 1.440 in2	
200bd/fy : 200(12)(7.5625)/60000 :	0.3025 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.7314 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.9 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.2294 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	2.00 ft
Heel Width	=	5.00
Total Footing Width	=	7.00
Footing Thickness	=	14.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	4,261	0	psf
Mu' : Upward	=	7,635	5,062	ft-#
Mu' : Downward	=	992	17,486	ft-#
Mu: Design	=	6,643 OK	12,424 ft-#	OK
phiMn	=	26,931	29,631	ft-#
Actual 1-Way Shear	=	29.42	30.04	psi
Allow 1-Way Shear	=	82.16	82.16	psi

Toe Reinforcing = # 7 @ 12.00 in
Heel Reinforcing = # 7 @ 12.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 7.93 in, #5@ 12.30 in, #6@ 17.46 in, #7@ 23.80 in, #8@ 31.34 in, #9@ 39.68 in, #10@ 50.39 in

Heel: #4@ 7.28 in, #5@ 11.29 in, #6@ 16.03 in, #7@ 21.86 in, #8@ 28.79 in, #9@ 36.44 in, #10@ 46.29 in

Key: No key defined

Min footing T&S reinf Area 2.12 in2
Min footing T&S reinf Area per foot 0.30 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 7.94 in	#4@ 15.87 in
#5@ 12.30 in	#5@ 24.60 in
#6@ 17.46 in	#6@ 34.92 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		3,852.2	4.95	19,051.4	Soil Over HL (ab. water tbl)	6,265.4	4.92	30,805.0
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		4.92	30,805.0
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	75.0	2.42	181.3
Added Lateral Load	=				* Axial Live Load on Stem	=			
Load @ Stem Above Soil	=				Soil Over Toe	=	476.7	1.00	476.7
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,708.8	2.42	4,129.5
					Earth @ Stem Transitions	=			
					Footing Weight	=	1,225.0	3.50	4,287.5
					Key Weight	=			
					Vert. Component	=			
Total	=	3,852.2	**O.T.M.** =	19,051.4	**Total =**		9,750.8 lbs	**R.M.=**	39,879.9

Resisting/Overturning Ratio = **2.09**

Vertical Loads used for Soil Pressure = 9,750.8 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.165	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 6.00 ft above top of footing

Lap Splice length for #6 bar specified in this stem design segment (25.4.2.3a) =	25.63 in
Development length for #6 bar specified in this stem design segment =	19.72 in

---

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

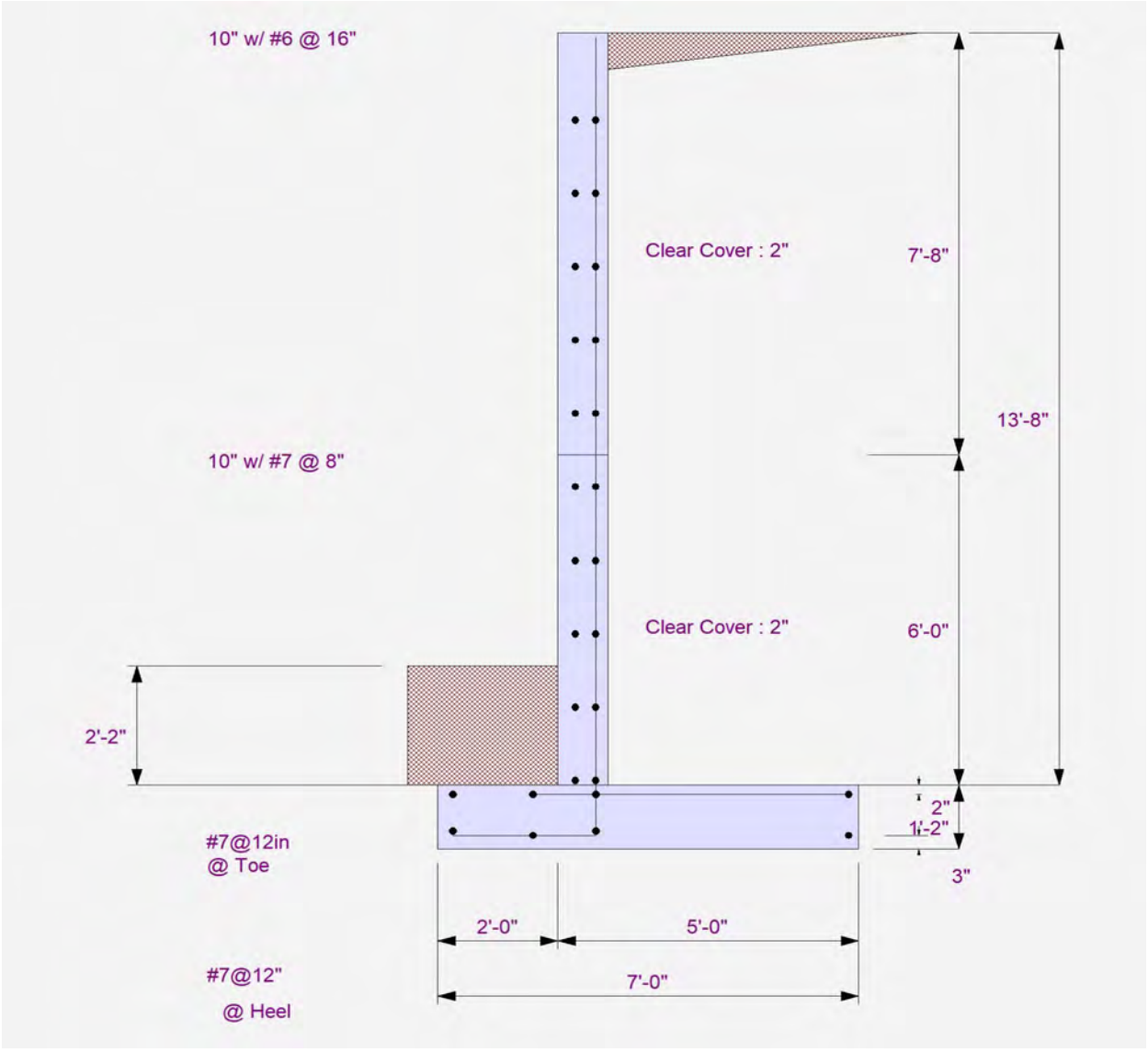
Lap Splice length for #7 bar specified in this stem design segment (25.4.2.3a) =	37.38 in
Development length for #7 bar specified in this stem design segment =	28.76 in
Hooked embedment length into footing for #7 bar specified in this stem design segment =	10.91 in
As Provided =	0.9000 in2/ft
As Required =	0.7314 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

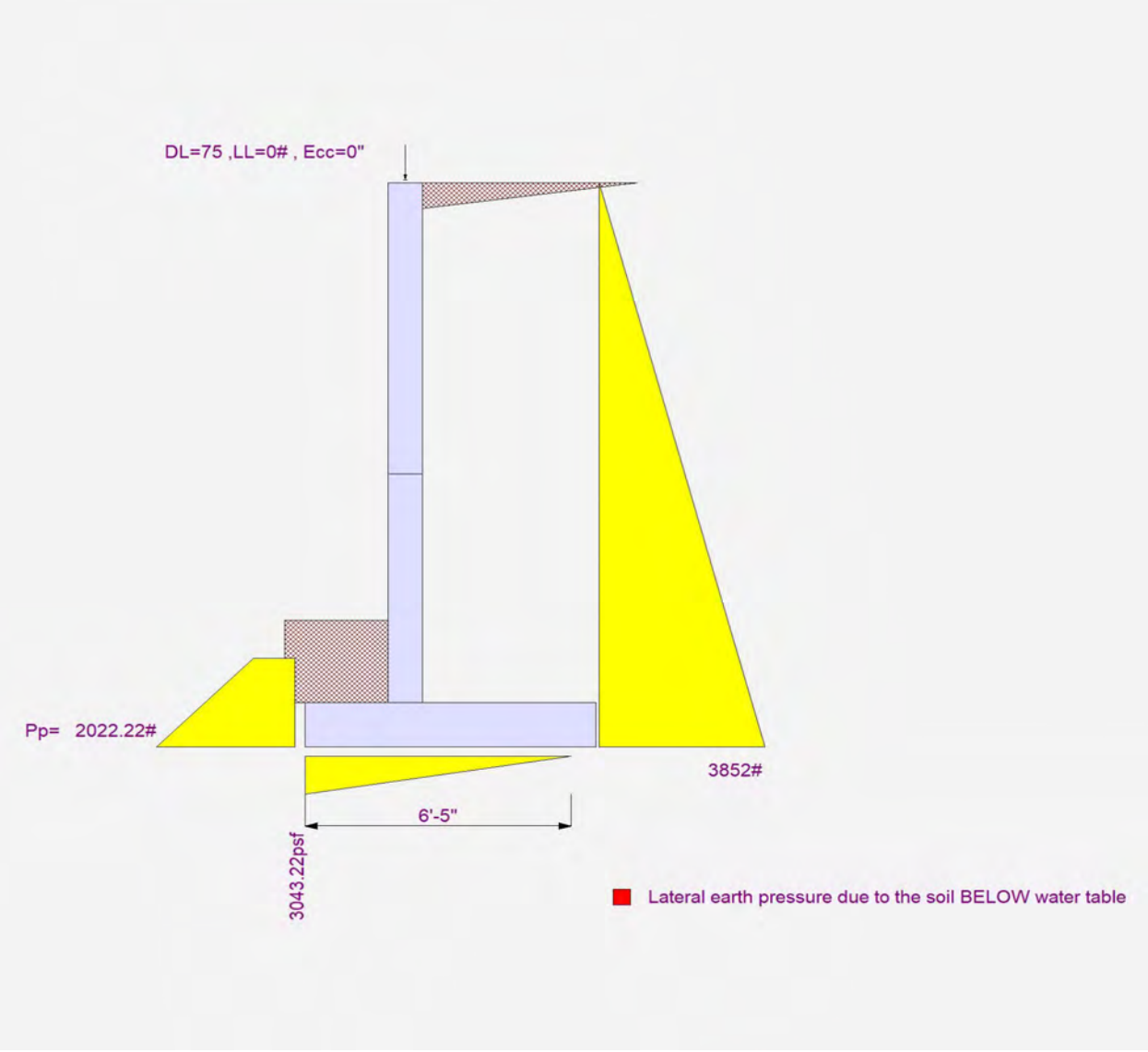
Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall



Cantilevered Retaining Wall

DESCRIPTION: Grid 5 Entry Stairs Retaining Wall



Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall

Code References

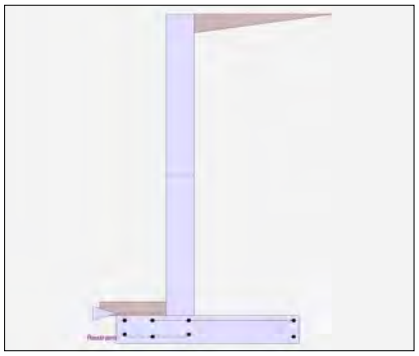
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16

Criteria

Retained Height	=	10.75 ft
Wall height above soil	=	0.00 ft
Slope Behind Wall	=	0.00
Height of Soil over Toe	=	6.00 in
Water height over heel	=	0.0 ft

Soil Data

Allow Soil Bearing	=	4,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	400.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing||Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

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

Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
Load Type	=	Wind (W) (Service Level)
Wind on Exposed Stem (Strength Level)	=	0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type		Spread Footing
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Axial Load Applied to Stem

Axial Dead Load	=	210.0 lbs
Axial Live Load	=	120.0 lbs
Axial Load Eccentricity	=	0.0 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall

Design Summary

Wall Stability Ratios

Overturning	=	2.11	OK
Slab Resists All Sliding !			
Global Stability	=	1.32	

Total Bearing Load	=	6,326 lbs	
...resultant ecc.	=	12.62 in	
Eccentricity outside middle third			
Soil Pressure @ Toe	=	2,483 psf	OK
Soil Pressure @ Heel	=	0 psf	OK
Allowable	=	4,000 psf	
Soil Pressure Less Than Allowable			
ACI Factored @ Toe	=	3,477 psf	
ACI Factored @ Heel	=	0 psf	
Footing Shear @ Toe	=	22.8 psi	OK
Footing Shear @ Heel	=	21.6 psi	OK
Allowable	=	82.2 psi	

Sliding Calcs

Lateral Sliding Force	=	2,416.1 lbs

Vertical component of active lateral soil pressure IS NOT considered in the calculation of soil bearing

Load Factors

Building Code	
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.600
Seismic, E	1.000

Stem Construction

		2nd	Bottom			
		Stem OK	Stem OK			
Design Height Above Ftg	ft =	5.00	0.00			
Wall Material Above "Ht"	=	Concrete	Concrete			
Design Method	=	SD	SD	SD	SD	SD
Thickness	=	10.00	10.00			
Rebar Size	=	# 5	# 5			
Rebar Spacing	=	16.00	8.00			
Rebar Placed at	=	Edge	Edge			
Design Data						
fb/FB + fa/Fa	=	**0.213**	**0.716**			
Total Force @ Section						
Service Level	lbs =					
Strength Level	lbs =	925.8	3,235.8			
Moment....Actual						
Service Level	ft-# =					
Strength Level	ft-# =	1,774.4	11,594.8			
Moment.....Allowable	ft-# =	8,327.0	16,175.5			
Shear.....Actual						
Service Level	psi =					
Strength Level	psi =	9.4	32.9			
Shear.....Allowable	psi =	82.2	82.2			
Anet (Masonry)	in2 =					
Wall Weight	psf =	125.0	125.0			
Rebar Depth 'd'	in =	8.19	8.19			

Masonry Data

f'm	psi =	
Fs	psi =	
Solid Grouting	=	
Modular Ratio 'n'	=	
Equiv. Solid Thick.	=	
Masonry Block Type	=	
Masonry Design Method	=	ASD

Concrete Data

f'c	psi =	3,000.0	3,000.0
Fy	psi =	60,000.0	60,000.0

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall

Concrete Stem Rebar Area Details

2nd Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.0501 in2/ft		
(4/3) * As :	0.0668 in2/ft	Min Stem T&S Reinf Area 1.380 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.216 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.2325 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Bottom Stem	Vertical Reinforcing	Horizontal Reinforcing	
As (based on applied moment) :	0.3274 in2/ft		
(4/3) * As :	0.4366 in2/ft	Min Stem T&S Reinf Area 1.200 in2	
200bd/fy : 200(12)(8.1875)/60000 :	0.3275 in2/ft	Min Stem T&S Reinf Area per ft of stem Height : 0.240 in2/ft	
0.0018bh : 0.0018(12)(10) :	0.216 in2/ft	Horizontal Reinforcing Options :	
	==========	One layer of :	Two layers of :
Required Area :	0.3275 in2/ft	#4@ 10.00 in	#4@ 20.00 in
Provided Area :	0.465 in2/ft	#5@ 15.50 in	#5@ 31.00 in
Maximum Area :	1.331 in2/ft	#6@ 22.00 in	#6@ 44.00 in

Footing Data

Toe Width	=	1.50 ft
Heel Width	=	4.00
Total Footing Width	=	5.50
Footing Thickness	=	12.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft

f'c = 3,000 psi Fy = 60,000 psi
Footing Concrete Density = 150.00 pcf
Min. As % = 0.0018
Cover @ Top 2.00 @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel	
Factored Pressure	=	3,477	0	psf
Mu' : Upward	=	3,528	2,394	ft-#
Mu' : Downward	=	277	8,017	ft-#
Mu: Design	=	3,251 OK	5,623	ft-# OK
phiMn	=	27,464	24,231	ft-#
Actual 1-Way Shear	=	22.81	21.60	psi
Allow 1-Way Shear	=	82.16	82.16	psi

Toe Reinforcing = # 8 @ 12.00 in
Heel Reinforcing = # 7 @ 12.00 in
Key Reinforcing = None Spec'd
Footing Torsion, Tu = 0.00 ft-lbs
Footing Allow. Torsion, phi Tu = 0.00 ft-lbs

If torsion exceeds allowable, provide supplemental design for footing torsion.

Other Acceptable Sizes & Spacings

Toe: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Heel: #4@ 9.25 in, #5@ 14.35 in, #6@ 20.37 in, #7@ 27.77 in, #8@ 36.57 in, #9@ 46.29 in, #10@ 58.79 in

Key: No key defined

Min footing T&S reinf Area 1.43 in2
Min footing T&S reinf Area per foot 0.26 in2 /ft

If one layer of horizontal bars:	If two layers of horizontal bars:
#4@ 9.26 in	#4@ 18.52 in
#5@ 14.35 in	#5@ 28.70 in
#6@ 20.37 in	#6@ 40.74 in

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall

Summary of Overturning & Resisting Forces & Moments

Item		.....OVERTURNING..... Force lbs	Distance ft	Moment ft-#		.....RESISTING..... Force lbs	Distance ft	Moment ft-#
HL Act Pres (ab water tbl)		2,416.1	3.92	9,463.0	Soil Over HL (ab. water tbl)	3,744.6	3.92	14,666.3
HL Act Pres (be water tbl)					Soil Over HL (bel. water tbl)		3.92	14,666.3
Hydrostatic Force					Water Table			
Buoyant Force	=				Sloped Soil Over Heel	=		
Surcharge over Heel	=				Surcharge Over Heel	=		
Surcharge Over Toe	=				Adjacent Footing Load	=		
Adjacent Footing Load	=				Axial Dead Load on Stem	=	210.0	1.92	402.5
Added Lateral Load	=				* Axial Live Load on Stem	=	120.0	1.92	230.0
Load @ Stem Above Soil	=				Soil Over Toe	=	82.5	0.75	61.9
	=				Surcharge Over Toe	=			
					Stem Weight(s)	=	1,343.8	1.92	2,575.5
					Earth @ Stem Transitions	=			
					Footing Weight	=	825.0	2.75	2,268.8
					Key Weight	=			
					Vert. Component	=			
Total	=	2,416.1	**O.T.M.** =	9,463.0	**Total =**		6,205.8 lbs	**R.M.=**	19,974.9

Resisting/Overturning Ratio = **2.11**

Vertical Loads used for Soil Pressure = 6,325.8 lbs

* Axial live load NOT included in total displayed, or used for overturning resistance, but is included for soil pressure calculation.

Vertical component of active lateral soil pressure IS NOT considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS NOT 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)

Soil Spring Reaction Modulus	250.0	pci
Horizontal Defl @ Top of Wall (approximate only)	0.135	in

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.

Cantilevered Retaining Wall

DESCRIPTION: Grid 3 Interior Retaining Wall

Rebar Lap & Embedment Lengths Information

Stem Design Segment: 2nd
Stem Design Height: 5.00 ft above top of footing

Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in

---

Stem Design Segment: Bottom
Stem Design Height: 0.00 ft above top of footing

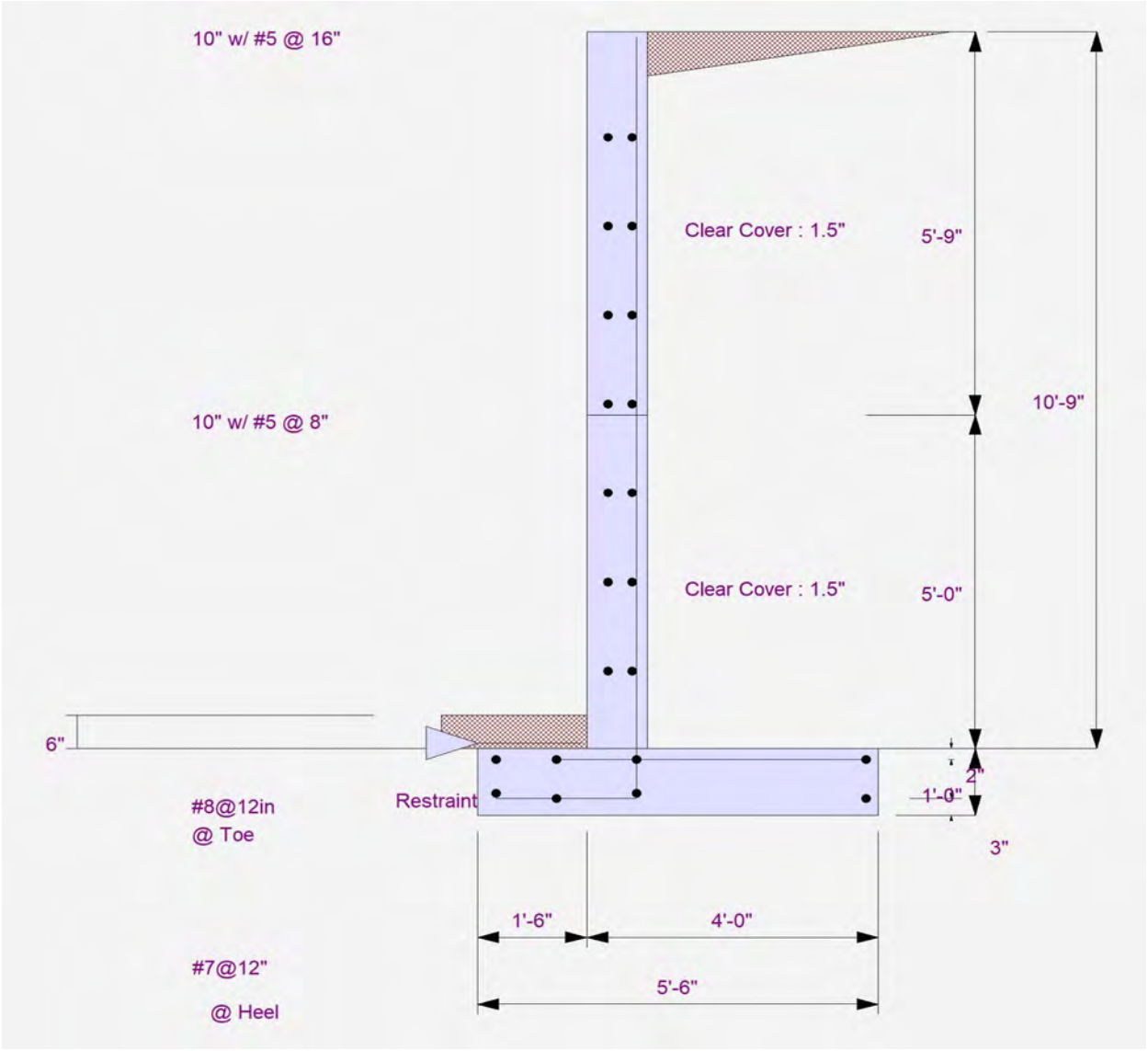
Lap Splice length for #5 bar specified in this stem design segment (25.4.2.3a) =	21.36 in
Development length for #5 bar specified in this stem design segment =	16.43 in
Hooked embedment length into footing for #5 bar specified in this stem design segment =	6.75 in
As Provided =	0.4650 in2/ft
As Required =	0.3275 in2/ft

Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall

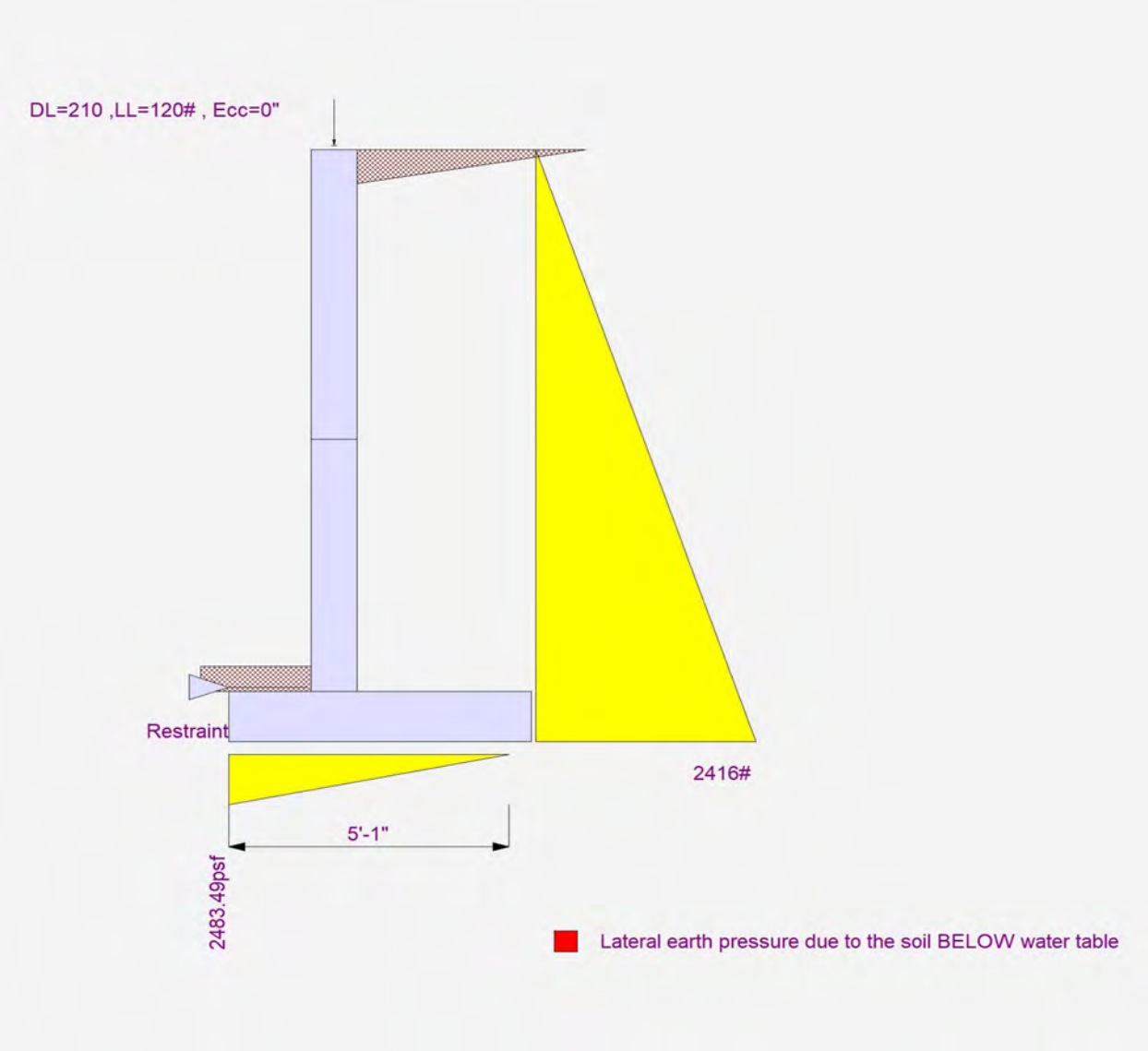


Project Title: Pratt Residence
Engineer: CM
Project ID: 22057
Project Descr:

Cantilevered Retaining Wall

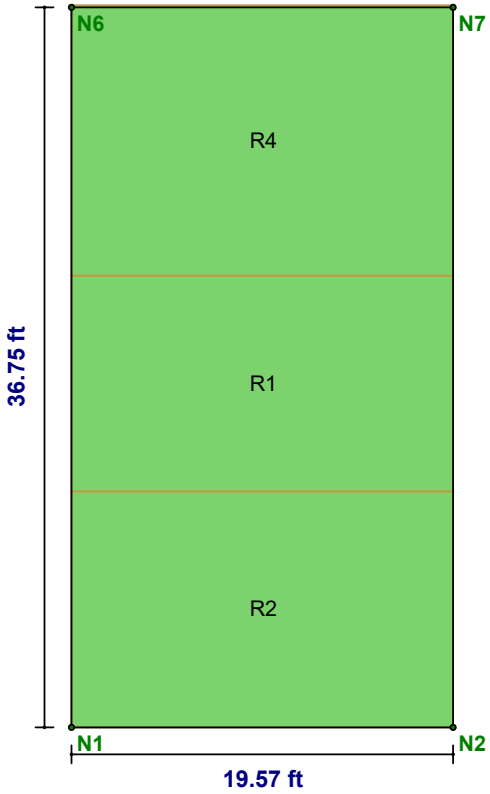
Project File: Pratt Residence Calculations.ec6

DESCRIPTION: Grid 3 Interior Retaining Wall



Detail Report: WP1

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	36.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.085	2	0.071	1	0.006	2	0.036	5	0.036	5	0.023	1
R2	0.159	5	0.073	5	0.005	5	0.139	6	0.286	6	0.019	1
R4	0.009	5	0.035	2	0.006	5	0.028	2	0.023	2	0.016	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP1 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

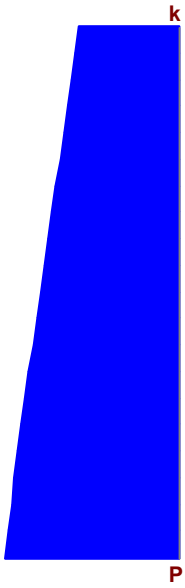
GEOMETRY

Total Height (ft):	11
Total Length (ft):	19.566
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

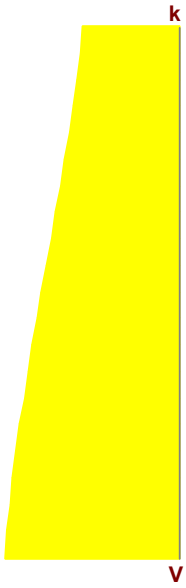
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

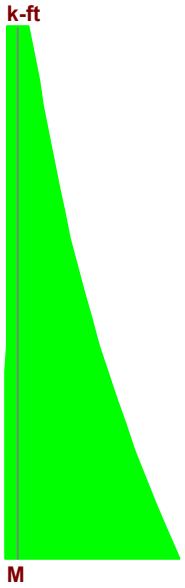
ENVELOPE DIAGRAMS



Min: 100.447 at 11 ft
Max: 175.231 at 0 ft



Min: -0.154 at 11 ft
Max: 88.35 at 0 ft



Min: -575.903 at 0 ft
Max: 38.576 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.085	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-575.903	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	6740.605		

SHEAR DETAILS

UC Max:	0.071	**phi*Vn (k):**	1251.699	**Vs (k):**	777.959
Location (ft):	0	**Vnmax (k):**	2375.928	**Gov LC:**	1
Gov Vu (k):	88.35	**Vc (k):**	890.973		

DEFLECTION DETAILS

Delta max (in):	0.006	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	7.044
rho Provided (H):	0.003	**As Provided (V) (in^2):**	13.254	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

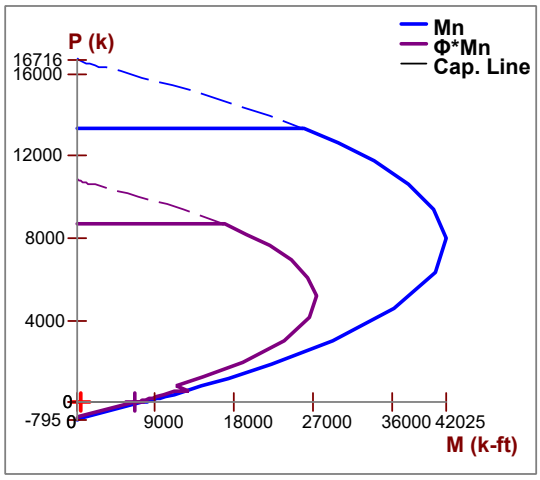
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	19.566	**Icracked (in^4):**	1.51e+7	**KL/r:**	1.948
A (in^2):	4695.84	**Cracked Mom, Mcr (k-ft):**	7263.657		
Igross (in^4):	2.157e+7	**r (in):**	56.708		

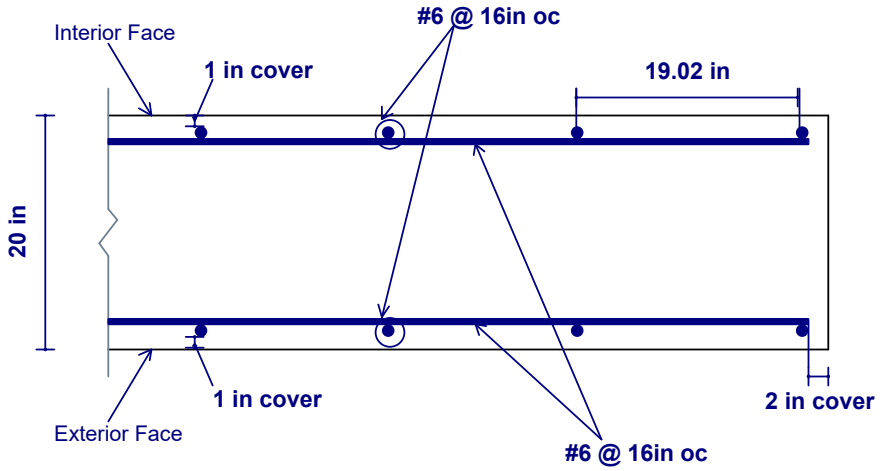
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



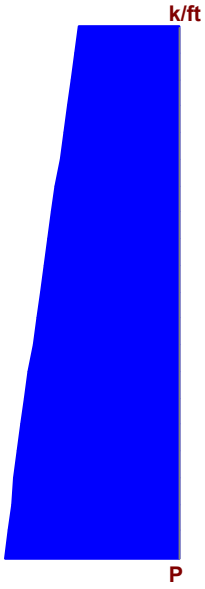
CROSS SECTION DETAILING



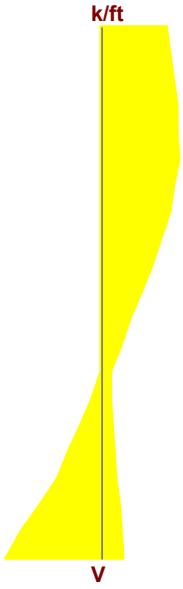
Detail Report: WP1 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

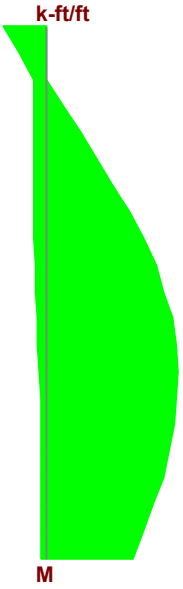
ENVELOPE DIAGRAMS



Min: 5.134 at 11 ft
Max: 8.956 at 0 ft



Min: -0.246 at 8.25 ft
Max: 0.306 at 0 ft



Min: -1.037 at 3.85 ft
Max: 0.322 at 11 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.036	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.322
Location (ft):	3.85	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	28.701
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.011	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	11	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-1.037	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	28.701	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.036	**Gov Vu (k/ft):**	0.306	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.435	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.023	**Location (ft):**	36.75
Deflection Ratio:	H/5723	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	13.254	**As min (V) (in^2):**	7.044
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

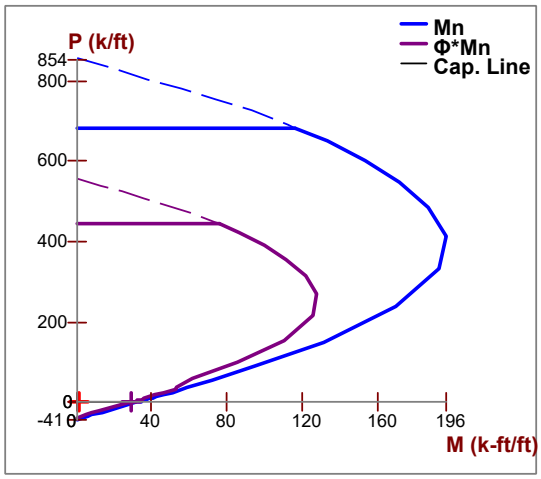
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	618.731		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

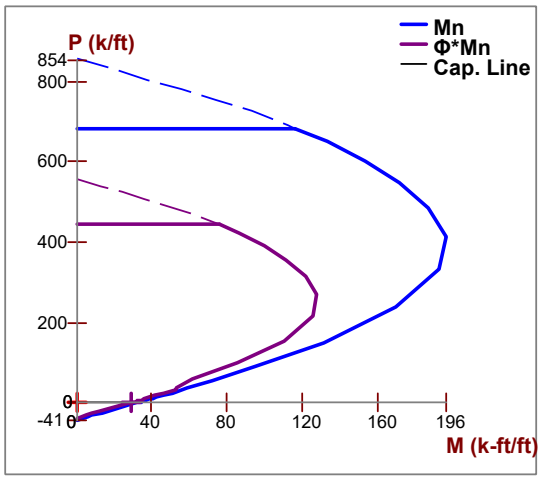
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

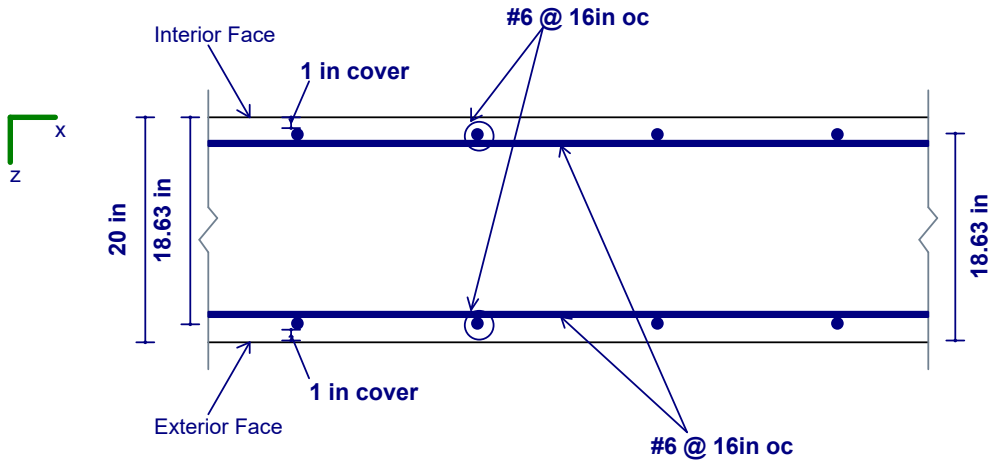
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



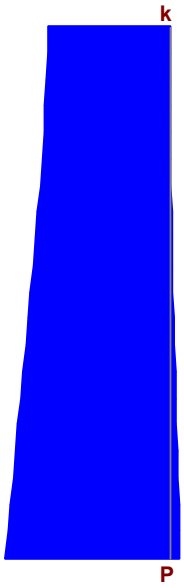
CROSS SECTION DETAILING



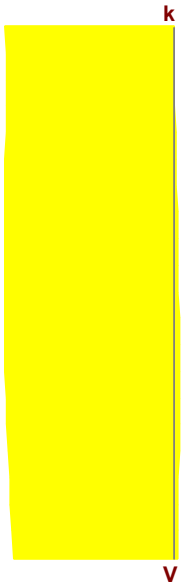
Detail Report: WP1 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

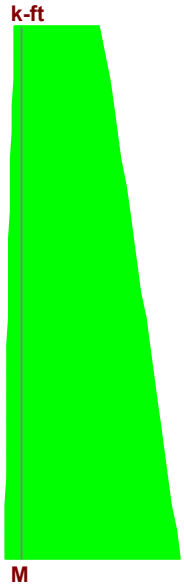
ENVELOPE DIAGRAMS



Min: -13.77 at 0 ft
Max: 234.686 at 0 ft



Min: -2.62 at 3.6 ft
Max: 91.252 at 6.6 ft



Min: -1071.748 at 0 ft
Max: 92.421 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.159	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-1071.748	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	6740.605		

SHEAR DETAILS

UC Max:	0.073	**phi*Vn (k):**	1251.699	**Vs (k):**	777.959
Location (ft):	6.6	**Vnmax (k):**	2375.928	**Gov LC:**	5
Gov Vu (k):	91.252	**Vc (k):**	890.973		

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	7.044
rho Provided (H):	0.003	**As Provided (V) (in^2):**	13.254	**rho min (V):**	0.002
As min (H) (in^2):	5.76	**rho Provided (V):**	0.003		

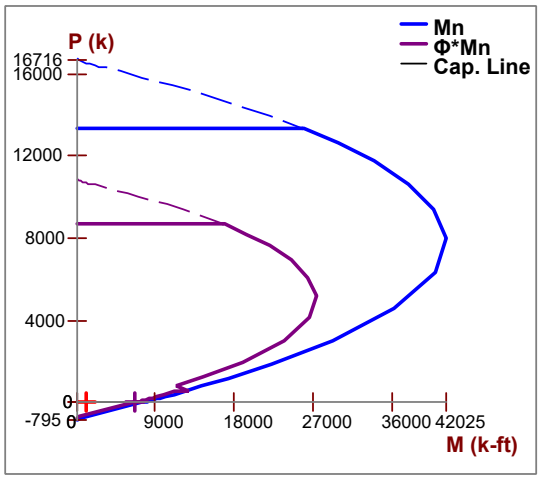
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	19.566	**Icracked (in^4):**	1.51e+7	**KL/r:**	2.125
A (in^2):	4695.84	**Cracked Mom, Mcr (k-ft):**	7263.657		
Igross (in^4):	2.157e+7	**r (in):**	56.708		

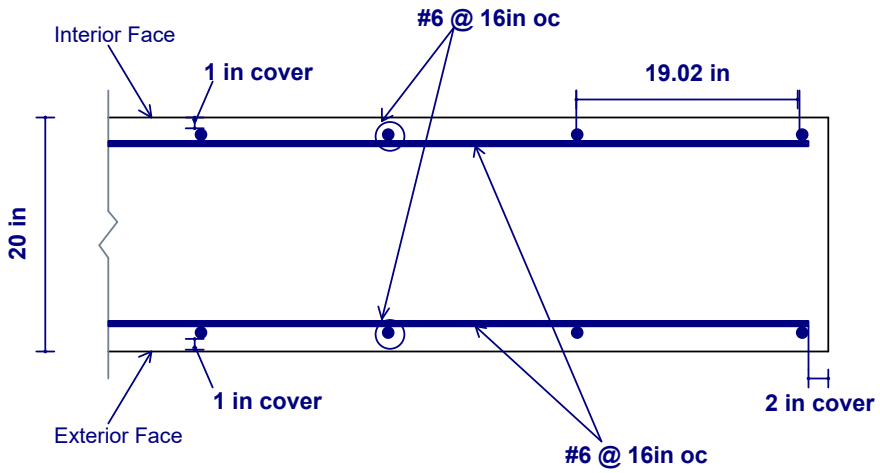
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



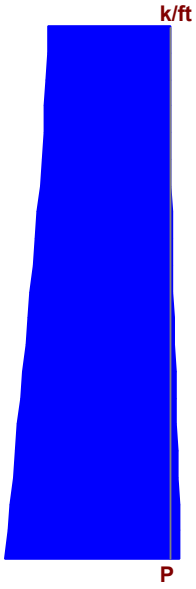
CROSS SECTION DETAILING



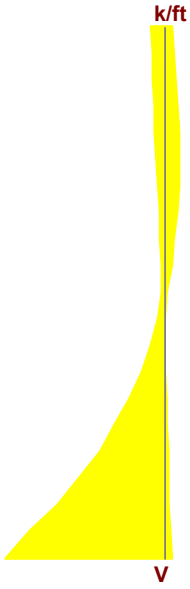
Detail Report: WP1 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

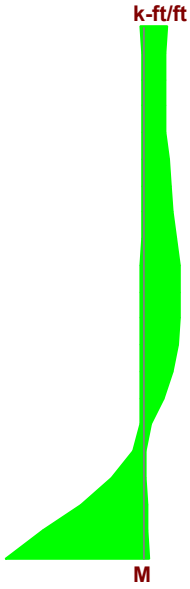
ENVELOPE DIAGRAMS



Min: -0.704 at 0 ft
Max: 11.995 at 0 ft



Min: -0.209 at 9 ft
Max: 2.302 at 0 ft



Min: -1.06 at 5.4 ft
Max: 3.98 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.037	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	3.98
Location (ft):	6	**Gov LC Int (-z):**	6	**phi*Mn Ext (+z) (k-ft/ft):**	28.701
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.139	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-1.06	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	28.701	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.286	**Gov Vu (k/ft):**	2.302	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.061	**Gov LC:**	6

DEFLECTION DETAILS

Delta max (in):	0.019	**Location (ft):**	36.75
Deflection Ratio:	H/7414	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	13.254	**As min (V) (in^2):**	7.044
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

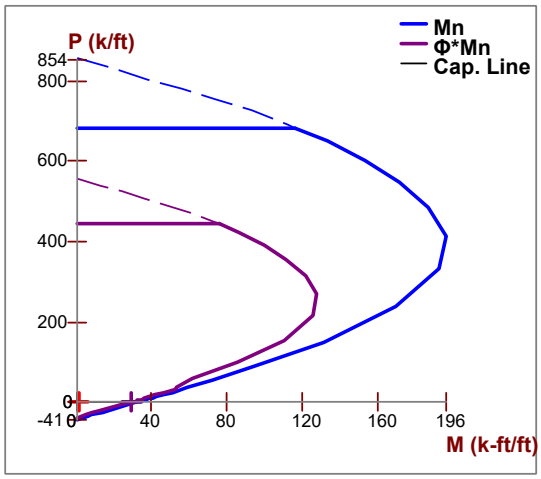
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	24.942
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	618.731		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

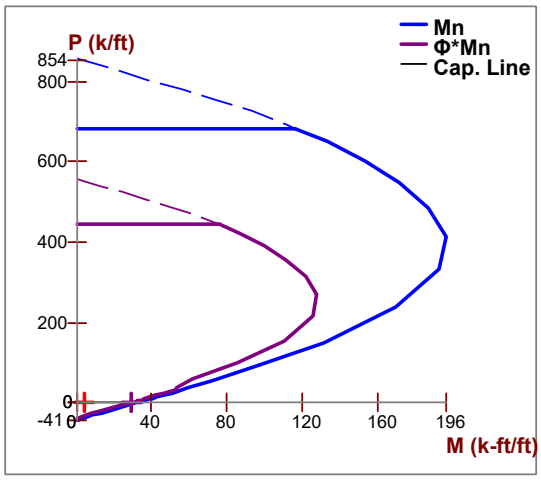
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

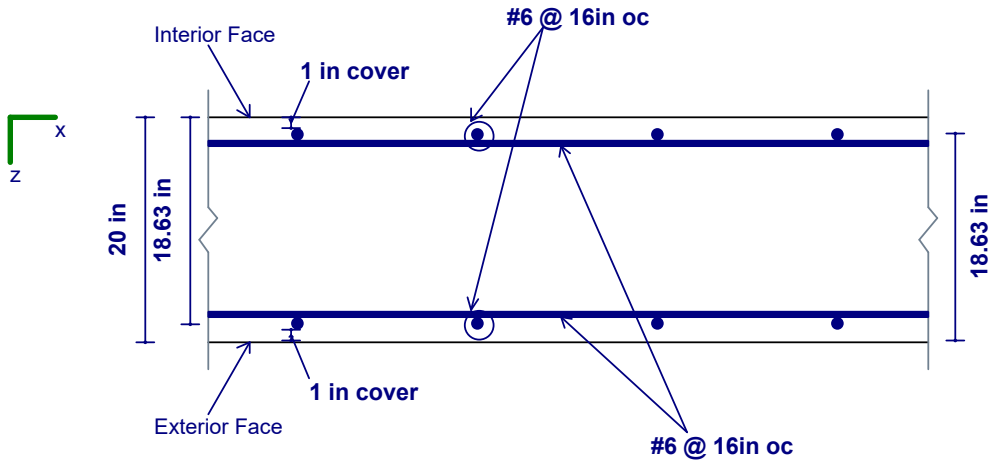
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



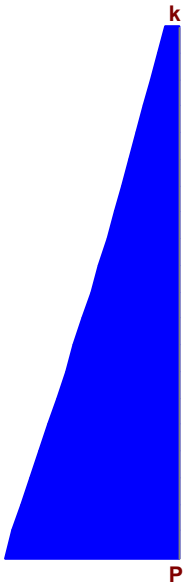
CROSS SECTION DETAILING



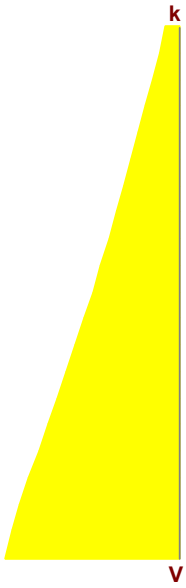
Detail Report: WP1 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

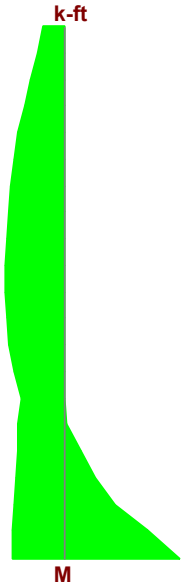
ENVELOPE DIAGRAMS



Min: 7.488 at 13.75 ft
Max: 97.61 at 0 ft



Min: -0.185 at 6.188 ft
Max: 44.42 at 0 ft



Min: -63.557 at 0 ft
Max: 31.725 at 7.563 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.009	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-63.557	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	6740.605		

SHEAR DETAILS

UC Max:	0.035	**phi*Vn (k):**	1251.699	**Vs (k):**	777.959
Location (ft):	0	**Vnmax (k):**	2375.928	**Gov LC:**	2
Gov Vu (k):	44.42	**Vc (k):**	890.973		

DEFLECTION DETAILS

Delta max (in):	0.006	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	7.044
rho Provided (H):	0.003	**As Provided (V) (in^2):**	13.254	**rho min (V):**	0.002
As min (H) (in^2):	6.6	**rho Provided (V):**	0.003		

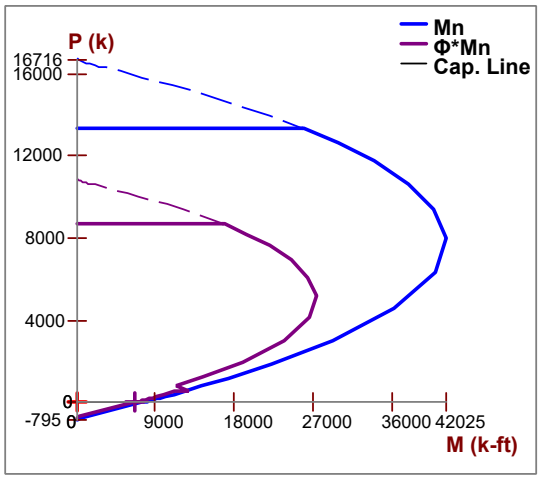
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	19.566	**Icracked (in^4):**	1.51e+7	**KL/r:**	2.434
A (in^2):	4695.84	**Cracked Mom, Mcr (k-ft):**	7263.657		
Igross (in^4):	2.157e+7	**r (in):**	56.708		

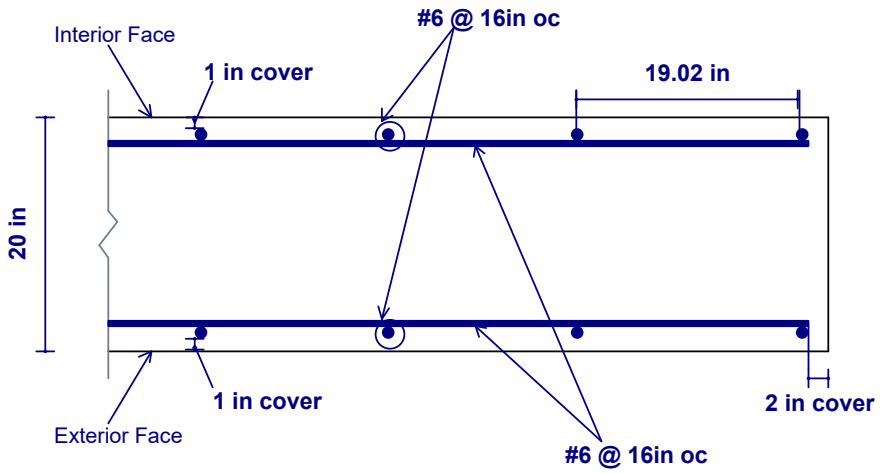
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



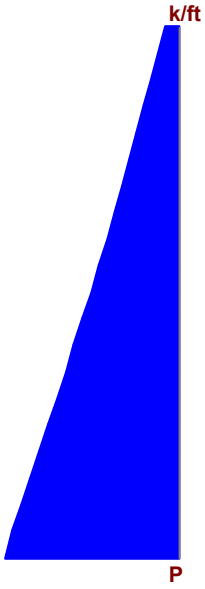
CROSS SECTION DETAILING



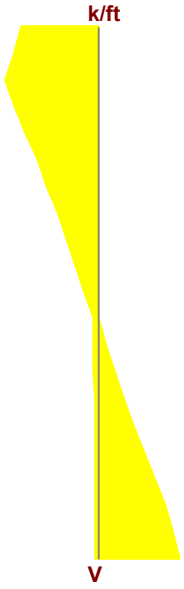
Detail Report: WP1 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	19.566	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

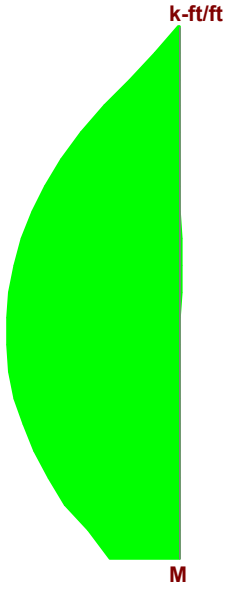
ENVELOPE DIAGRAMS



Min: 0.383 at 13.75 ft
Max: 4.989 at 0 ft



Min: -0.166 at 0 ft
Max: 0.185 at 12.375 ft



Min: -0.004 at 4.813 ft
Max: 0.806 at 5.5 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.806
Location (ft):	7.562	**Gov LC Int (-z):**	13	**phi*Mn Ext (+z) (k-ft/ft):**	28.701
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.028	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	6.188	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.004	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	28.701	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.023	**Gov Vu (k/ft):**	0.185	**phi*Vns (k/ft):**	0
Location (ft):	12.375	**phi*Vnc (k/ft):**	8.155	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.016	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	13.254	**As min (V) (in^2):**	7.044
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

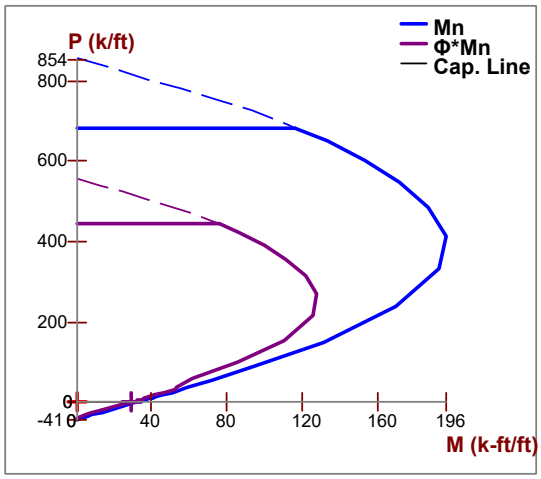
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	28.579
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	618.731		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

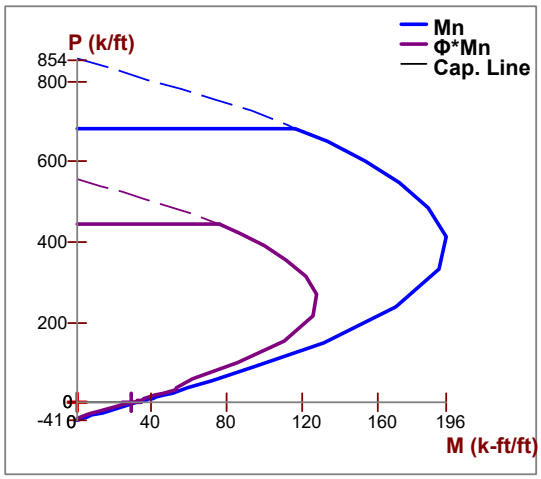
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

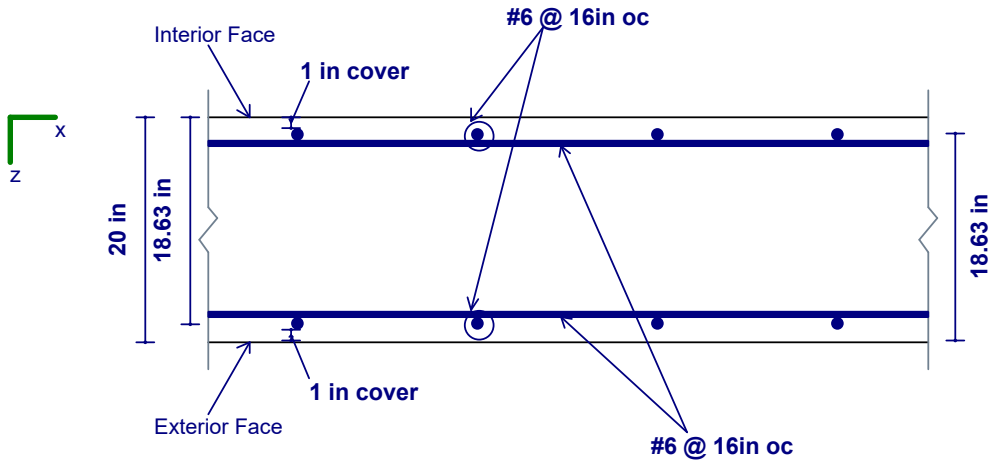
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

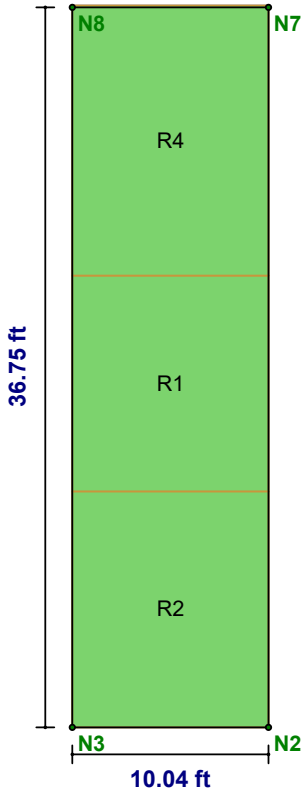


CROSS SECTION DETAILING



Detail Report: WP2

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	36.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.095	5	0.063	1	0.014	2	0.034	1	0.077	5	0.059	2
R2	0.143	5	0.054	1	0.009	2	0.074	1	0.275	2	0.079	2
R4	0.03	1	0.059	1	0.018	2	0.033	1	0.027	2	0.047	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP2 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

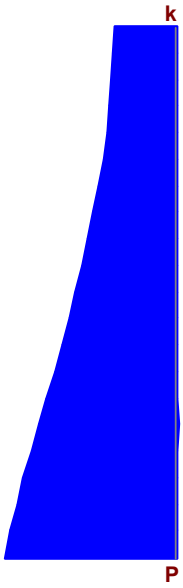
GEOMETRY

Total Height (ft):	11
Total Length (ft):	10.038
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

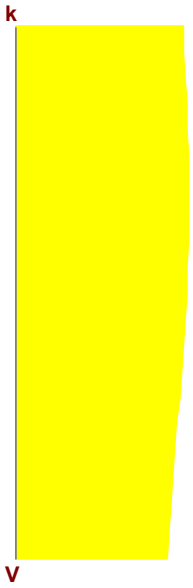
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

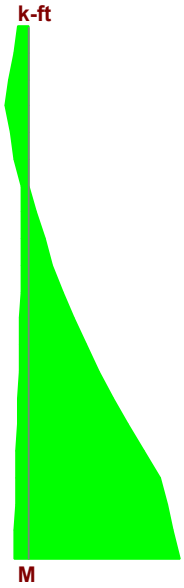
ENVELOPE DIAGRAMS



Min: -2.262 at 2.75 ft
Max: 142.191 at 0 ft



Min: -40.229 at 7.15 ft
Max: -35.34 at 0 ft



Min: -176.251 at 0 ft
Max: 24.74 at 9.35 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.095	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-176.251	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	1848.779		

SHEAR DETAILS

UC Max:	0.063	**phi*Vn (k):**	642.163	**Vs (k):**	399.119
Location (ft):	7.15	**Vnmax (k):**	1218.929	**Gov LC:**	1
Gov Vu (k):	-40.229	**Vc (k):**	457.098		

DEFLECTION DETAILS

Delta max (in):	0.014	**Location (ft):**	36.75
Deflection Ratio:	H/9258	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	3.614
rho Provided (H):	0.003	**As Provided (V) (in^2):**	7.069	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

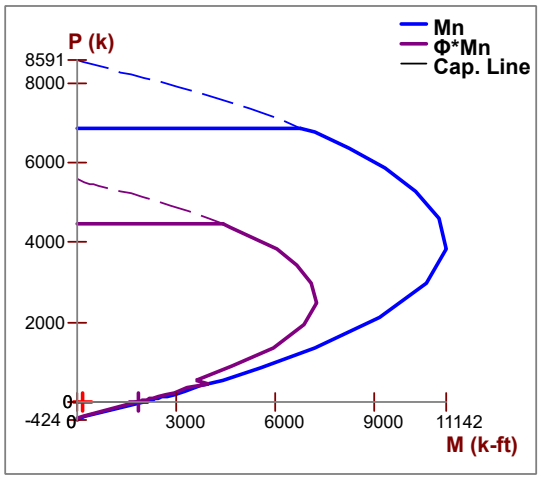
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	10.038	**Icracked (in^4):**	2.039e+6	**KL/r:**	3.796
A (in^2):	2409.12	**Cracked Mom, Mcr (k-ft):**	1911.814		
Igross (in^4):	2.913e+6	**r (in):**	29.093		

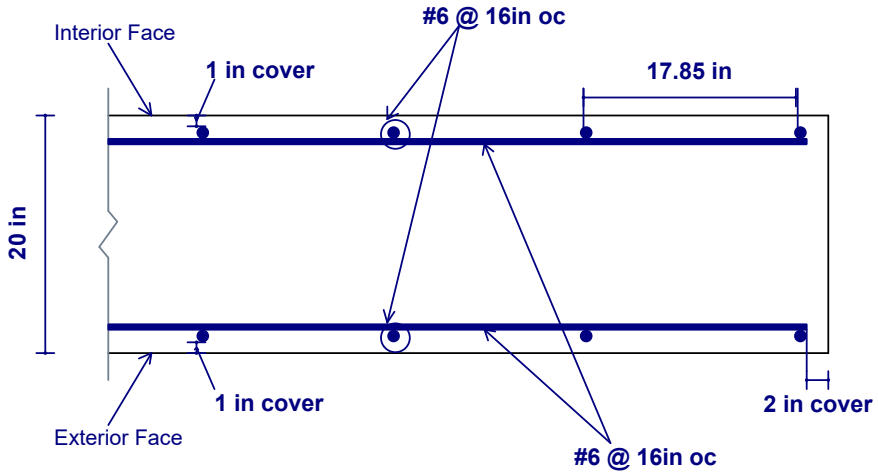
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



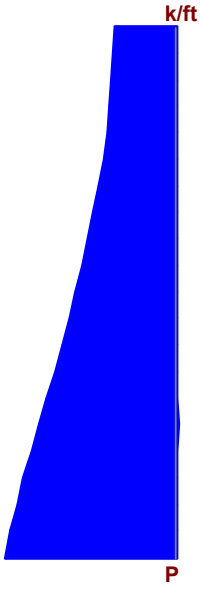
CROSS SECTION DETAILING



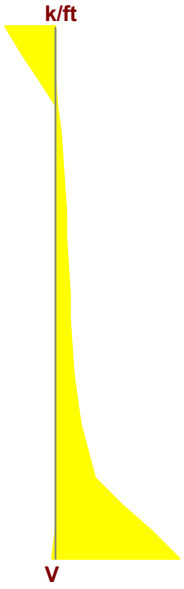
Detail Report: WP2 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

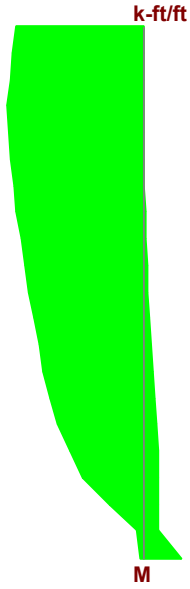
ENVELOPE DIAGRAMS



Min: -0.225 at 2.75 ft
Max: 14.165 at 0 ft



Min: -0.702 at 0 ft
Max: 0.273 at 11 ft



Min: -0.283 at 0 ft
Max: 1.013 at 9.35 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.032	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	1.013
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z) (k-ft/ft):**	29.765
Gov Pu Int (-z) (k/ft):	14.165	**UC Max Ext (+z):**	0.034	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	445.045	**Location (ft):**	9.35	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-0.27	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	8.481	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.077	**Gov Vu (k/ft):**	-0.702	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	9.157	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.059	**Location (ft):**	36.75
Deflection Ratio:	H/2254	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.069	**As min (V) (in^2):**	3.614
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

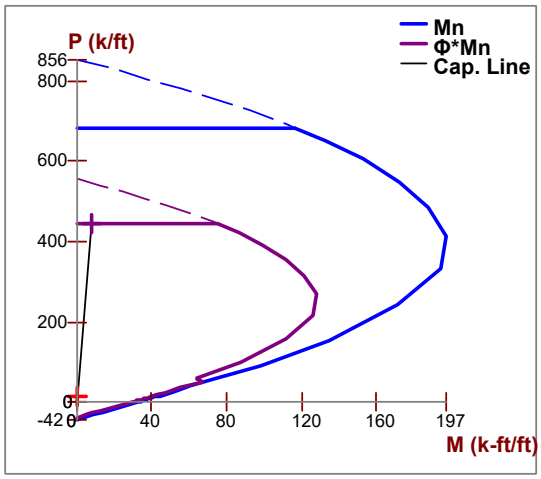
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	317.429		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

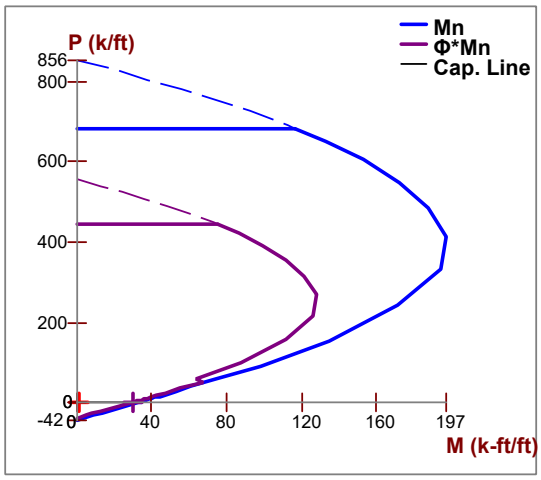
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

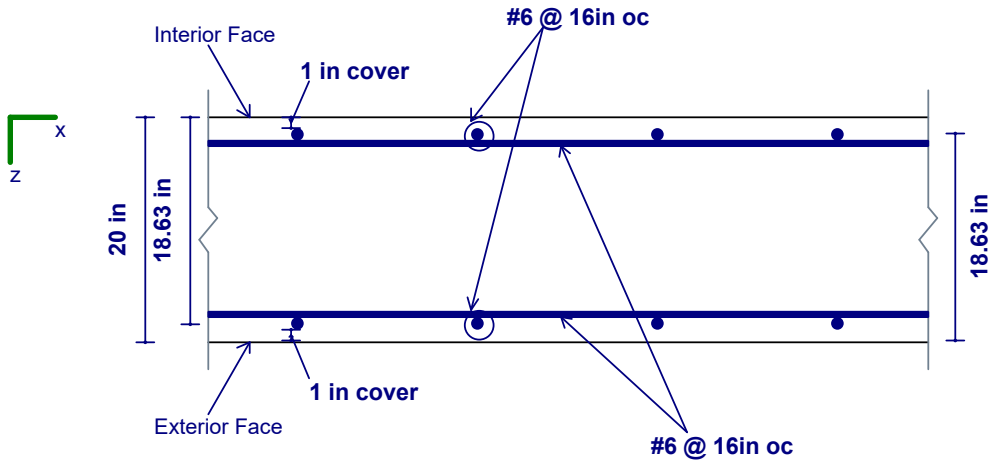
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



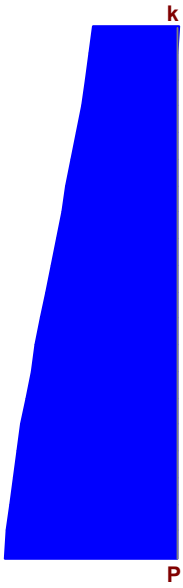
CROSS SECTION DETAILING



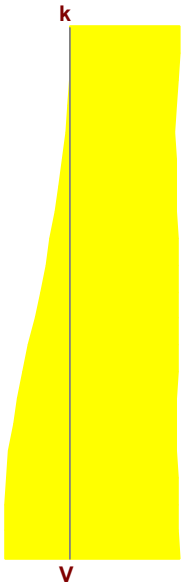
Detail Report: WP2 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

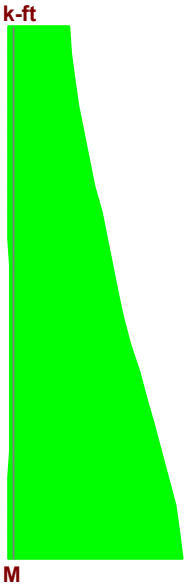
ENVELOPE DIAGRAMS



Min: -1.777 at 12 ft
Max: 317.976 at 0 ft



Min: -34.54 at 12 ft
Max: 19.771 at 0 ft



Min: -767.446 at 0 ft
Max: 17.701 at 9.6 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.143	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	11.4	**Gov Mu (k-ft):**	-263.961	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	1848.779		

SHEAR DETAILS

UC Max:	0.054	**phi*Vn (k):**	642.163	**Vs (k):**	399.119
Location (ft):	12	**Vnmax (k):**	1218.929	**Gov LC:**	1
Gov Vu (k):	-34.54	**Vc (k):**	457.098		

DEFLECTION DETAILS

Delta max (in):	0.009	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	3.614
rho Provided (H):	0.003	**As Provided (V) (in^2):**	7.069	**rho min (V):**	0.002
As min (H) (in^2):	5.76	**rho Provided (V):**	0.003		

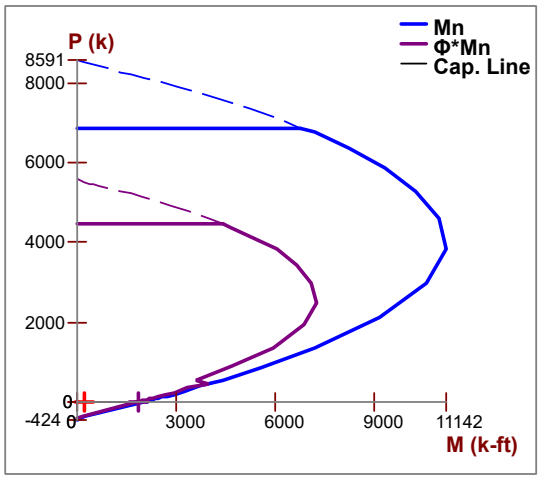
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	10.038	**Icracked (in^4):**	2.039e+6	**KL/r:**	4.141
A (in^2):	2409.12	**Cracked Mom, Mcr (k-ft):**	1911.814		
Igross (in^4):	2.913e+6	**r (in):**	29.093		

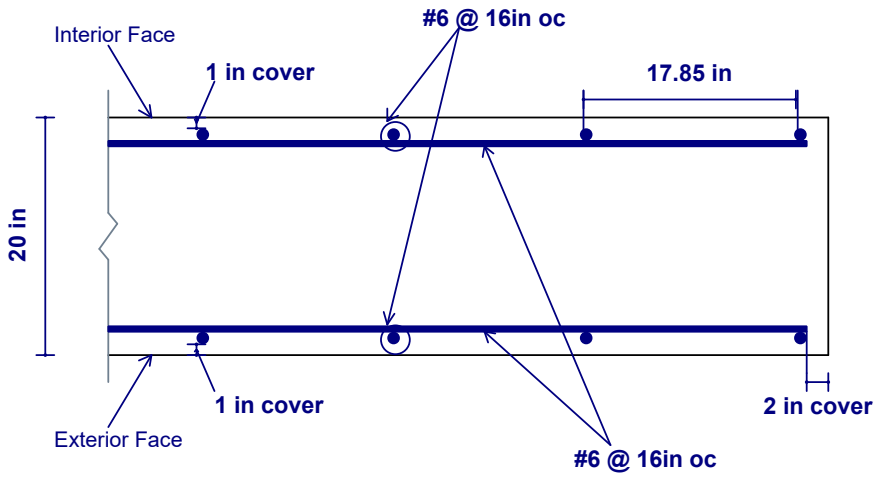
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



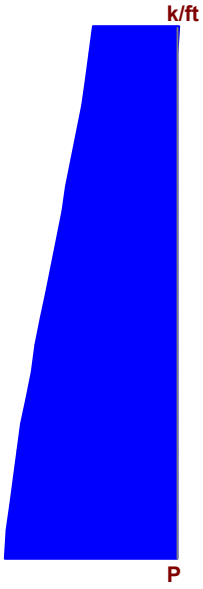
CROSS SECTION DETAILING



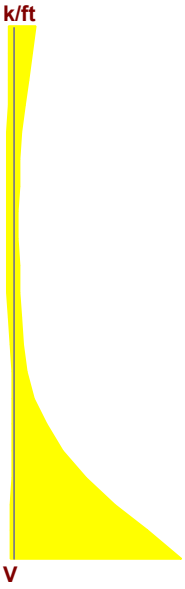
Detail Report: WP2 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

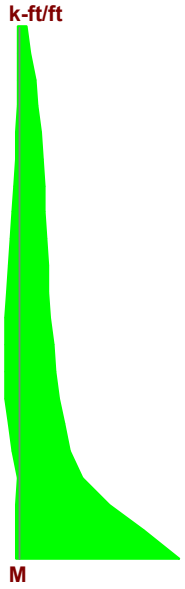
ENVELOPE DIAGRAMS



Min: -0.177 at 12 ft
Max: 31.677 at 0 ft



Min: -2.976 at 0 ft
Max: 0.101 at 7.2 ft



Min: -6.293 at 0 ft
Max: 0.497 at 4.2 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.074	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	31.677	**UC Max Ext (+z):**	0.071	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	428.292	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-6.246	**Gov Pu Ext (+z) (k/ft):**	31.677		
phi*Mn Int (-z) (k-ft/ft):	84.443	**phi*Pn Ext (+z) (k/ft):**	445.045		

SHEAR DETAILS

UC Max:	0.275	**Gov Vu (k/ft):**	-2.976	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	10.827	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.079	**Location (ft):**	36.75
Deflection Ratio:	H/1815	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.069	**As min (V) (in^2):**	3.614
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

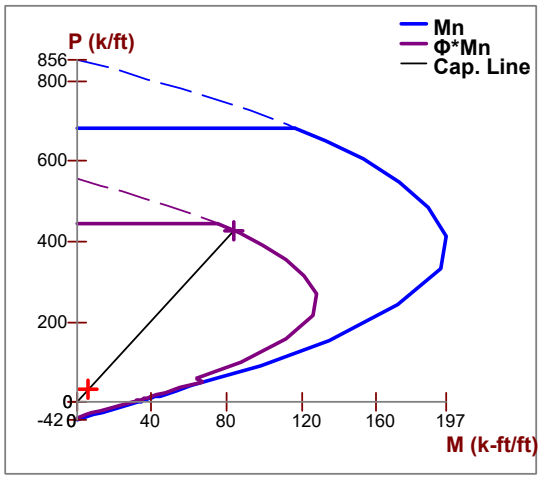
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	24.942
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	317.429		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

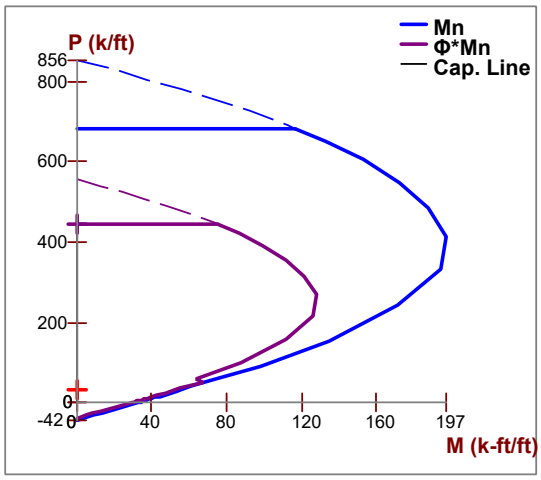
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

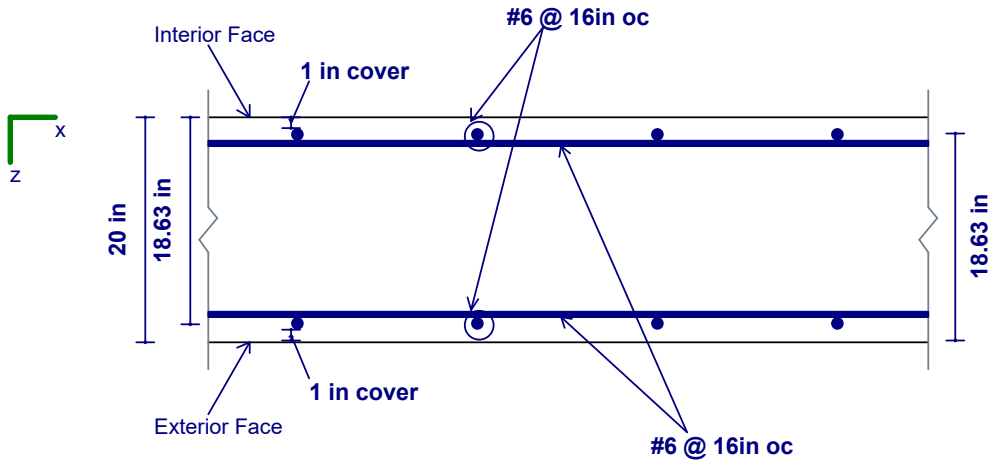
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



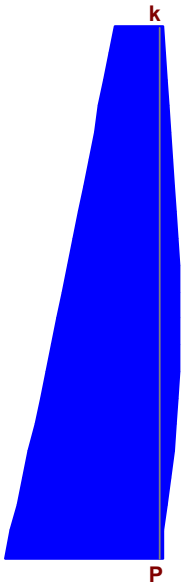
CROSS SECTION DETAILING



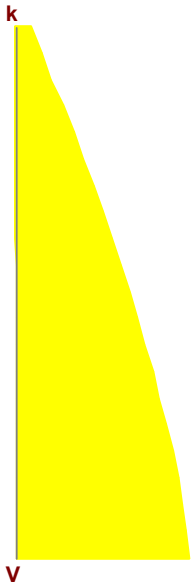
Detail Report: WP2 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

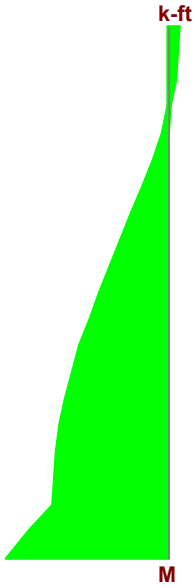
ENVELOPE DIAGRAMS



Min: -6.445 at 6.188 ft
Max: 49.18 at 0 ft



Min: -37.671 at 0 ft
Max: 0.088 at 12.375 ft



Min: -3.948 at 13.75 ft
Max: 55.196 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.03	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	55.196	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	1830.886		

SHEAR DETAILS

UC Max:	0.059	**phi*Vn (k):**	642.163	**Vs (k):**	399.119
Location (ft):	0	**Vnmax (k):**	1218.929	**Gov LC:**	1
Gov Vu (k):	-37.671	**Vc (k):**	457.098		

DEFLECTION DETAILS

Delta max (in):	0.018	**Location (ft):**	36.75
Deflection Ratio:	H/9136	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	3.614
rho Provided (H):	0.003	**As Provided (V) (in^2):**	7.069	**rho min (V):**	0.002
As min (H) (in^2):	6.6	**rho Provided (V):**	0.003		

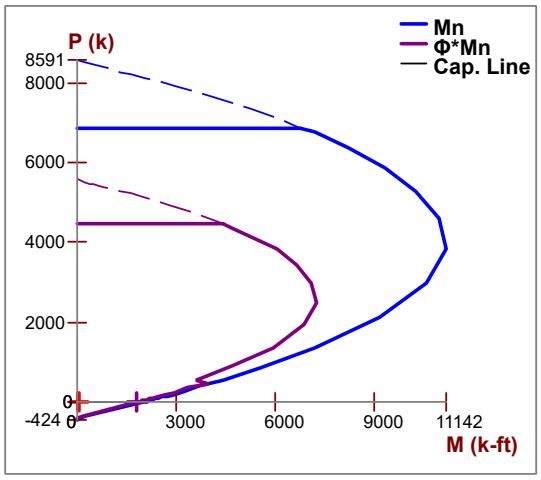
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	10.038	**Icracked (in^4):**	2.039e+6	**KL/r:**	4.745
A (in^2):	2409.12	**Cracked Mom, Mcr (k-ft):**	1911.814		
Igross (in^4):	2.913e+6	**r (in):**	29.093		

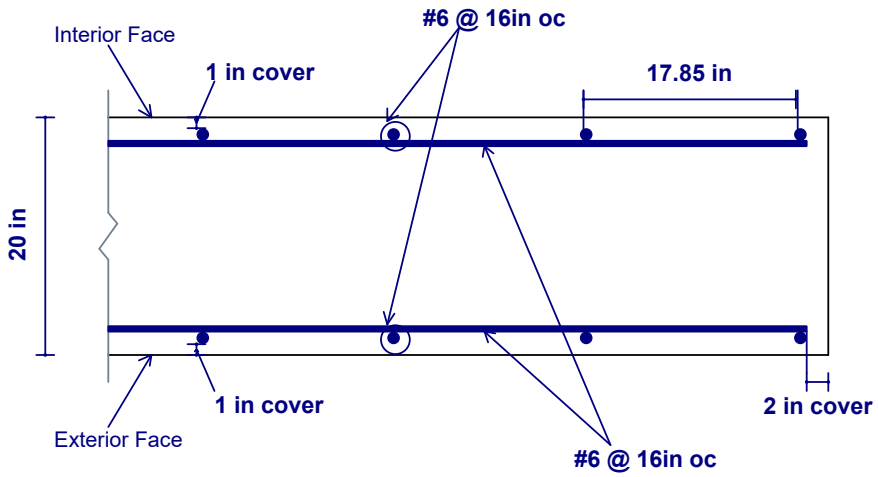
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



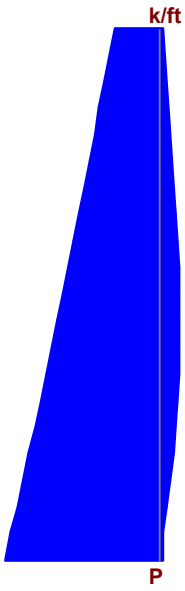
CROSS SECTION DETAILING



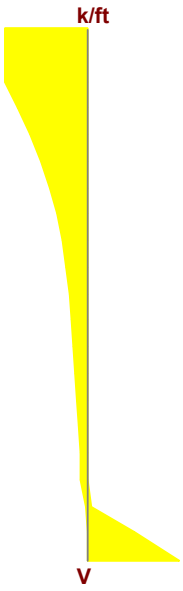
Detail Report: WP2 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	10.038	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

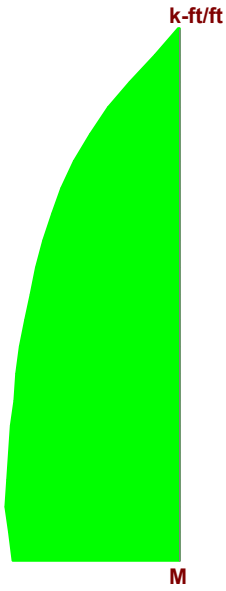
ENVELOPE DIAGRAMS



Min: -0.642 at 6.188 ft
Max: 4.899 at 0 ft



Min: -0.22 at 0 ft
Max: 0.198 at 12.375 ft



Min: 0 at 13.75 ft
Max: 0.983 at 1.375 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.983
Location (ft):	12.375	**Gov LC Int (-z):**	4	**phi*Mn Ext (+z) (k-ft/ft):**	29.765
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.033	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	1.375	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-0.0001396	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	29.765	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.027	**Gov Vu (k/ft):**	-0.22	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.251	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.047	**Location (ft):**	1.837
Deflection Ratio:	H/3545	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.069	**As min (V) (in^2):**	3.614
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

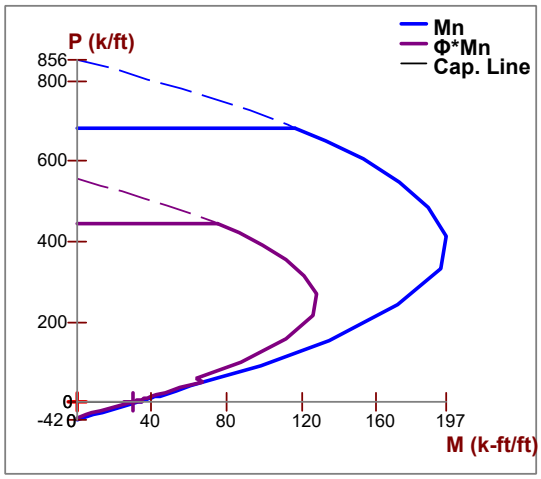
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	28.579
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	317.429		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

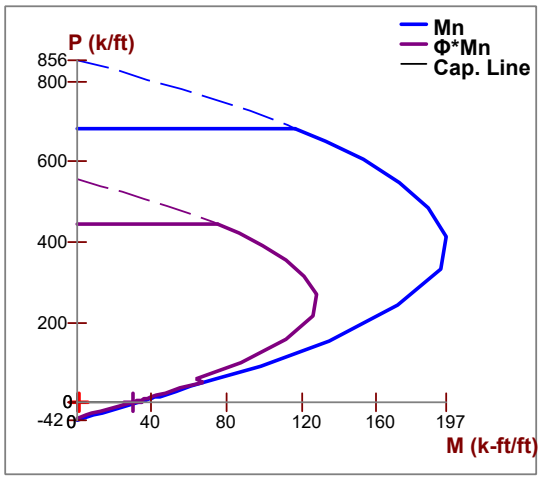
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

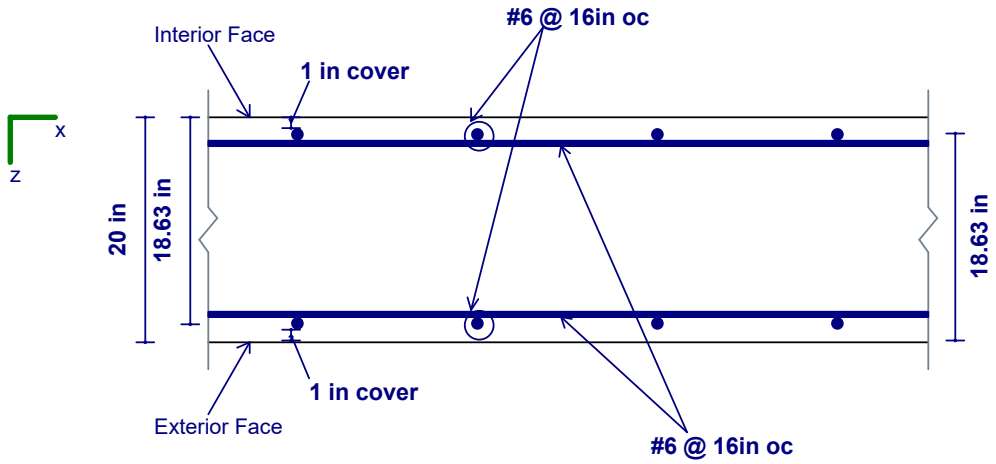
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

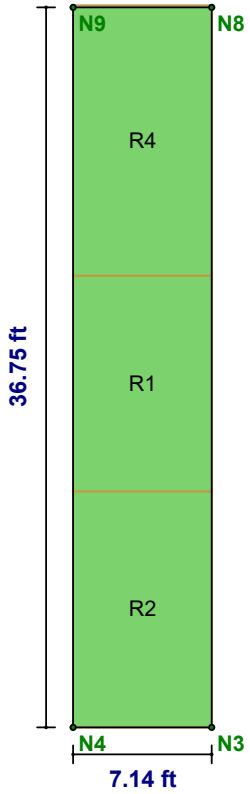


CROSS SECTION DETAILING



Detail Report: WP3

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	36.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.269	5	0.261	5	0.049	2	0.02	2	0.044	2	0.031	2
R2	0.729	1	0.365	2	0.037	2	0.219	5	0.112	2	0.041	2
R4	0.025	1	0.097	5	0.056	2	0.012	2	0.026	2	0.023	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@12in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP3 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

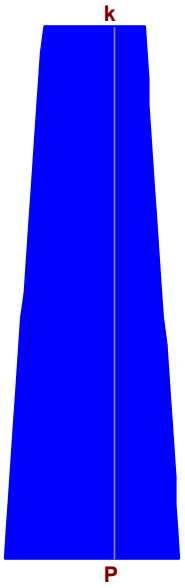
GEOMETRY

Total Height (ft):	11
Total Length (ft):	7.142
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

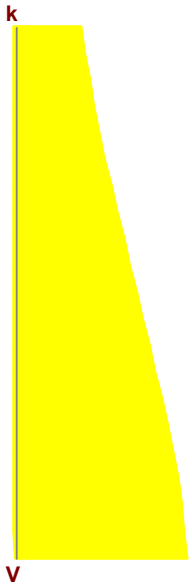
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

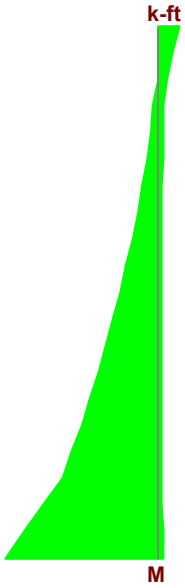
ENVELOPE DIAGRAMS



Min: -37.081 at 0 ft
Max: 62.083 at 0 ft



Min: -117.709 at 0 ft
Max: 1.151 at 3.85 ft



Min: -36.369 at 11 ft
Max: 261.164 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.269	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	261.164	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	971.459		

SHEAR DETAILS

UC Max:	0.261	**phi*Vn (k):**	450.411	**Vs (k):**	283.991
Location (ft):	0	**Vnmax (k):**	867.324	**Gov LC:**	5
Gov Vu (k):	-117.709	**Vc (k):**	316.557		

DEFLECTION DETAILS

Delta max (in):	0.049	**Location (ft):**	36.75
Deflection Ratio:	H/2688	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	2.571
rho Provided (H):	0.003	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

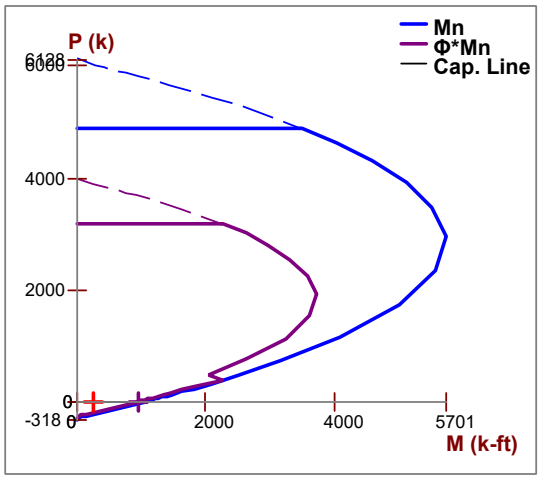
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	5.335
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

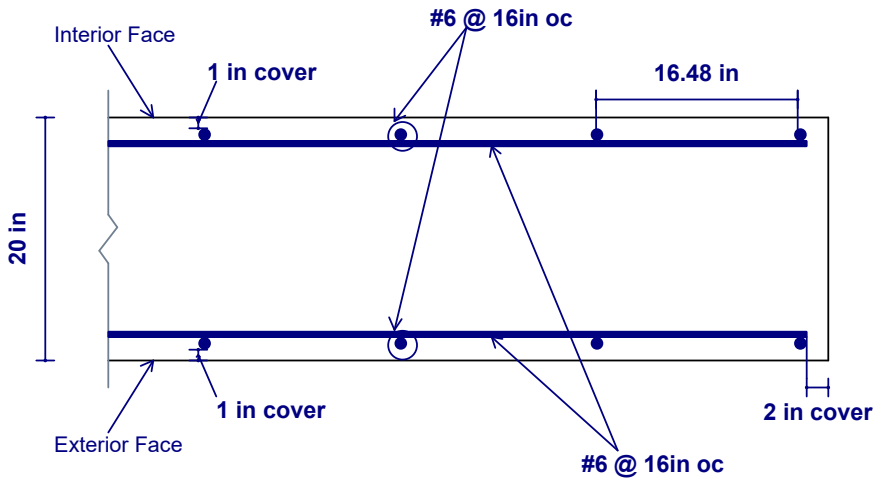
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



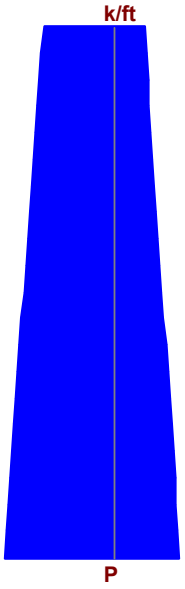
CROSS SECTION DETAILING



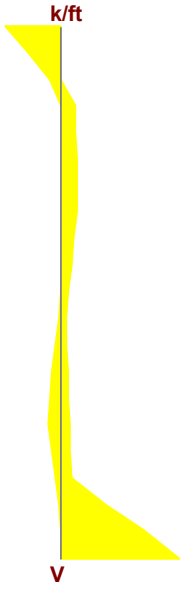
Detail Report: WP3 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

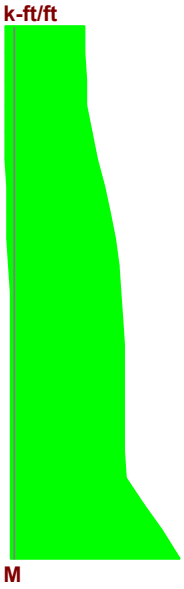
ENVELOPE DIAGRAMS



Min: -5.192 at 0 ft
Max: 8.692 at 0 ft



Min: -0.345 at 0 ft
Max: 0.155 at 11 ft



Min: -0.613 at 0 ft
Max: 0.026 at 9.9 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.02	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.026
Location (ft):	0	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z) (k-ft/ft):**	31.274
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.001	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	11	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-0.613	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	31.274	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.044	**Gov Vu (k/ft):**	-0.345	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	7.791	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.031	**Location (ft):**	36.75
Deflection Ratio:	H/4312	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	2.571
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

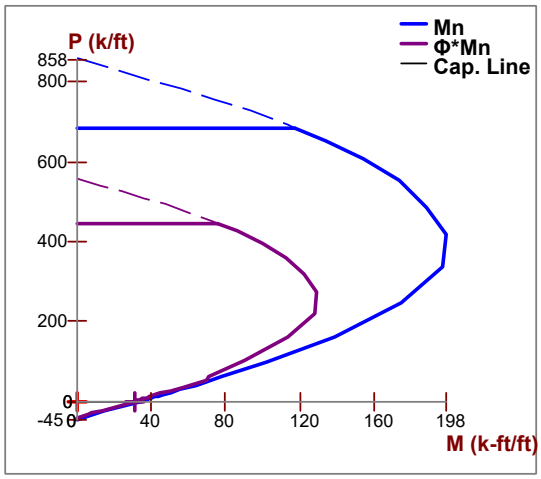
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

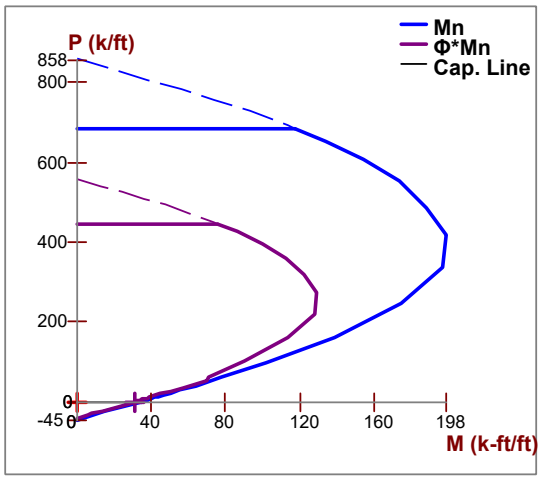
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

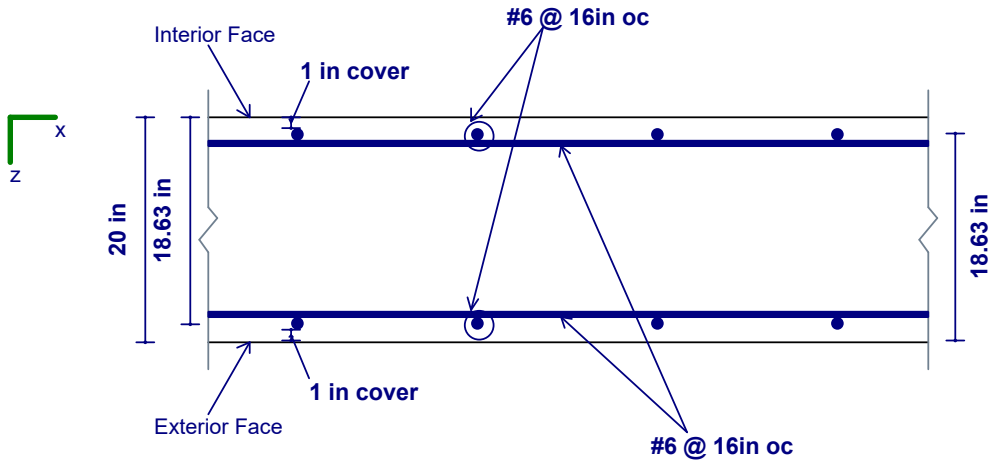
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



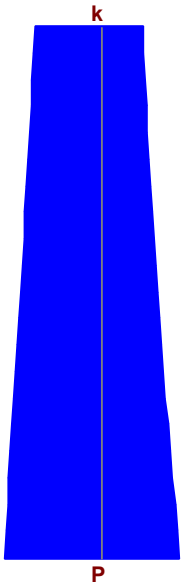
CROSS SECTION DETAILING



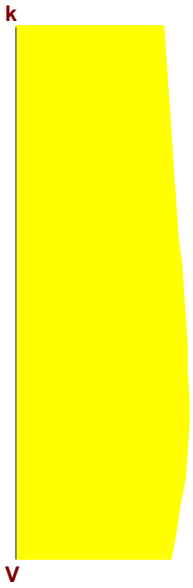
Detail Report: WP3 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	12	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

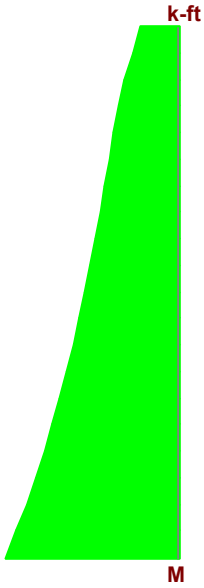
ENVELOPE DIAGRAMS



Min: -73.031 at 0 ft
Max: 91.198 at 0 ft



Min: -143.575 at 3.6 ft
Max: -122.414 at 12 ft



Min: -10.535 at 0 ft
Max: 828.625 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.729	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	820.984	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	1126.188		

SHEAR DETAILS

UC Max:	0.365	**phi*Vn (k):**	362.355	**Vs (k):**	283.991
Location (ft):	0.6	**Vnmax (k):**	867.324	**Gov LC:**	2
Gov Vu (k):	-132.171	**Vc (k):**	199.149		

DEFLECTION DETAILS

Delta max (in):	0.037	**Location (ft):**	36.75
Deflection Ratio:	H/3939	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	4.285
rho Provided (H):	0.003	**As Provided (V) (in^2):**	6.185	**rho min (V):**	0.002
As min (H) (in^2):	7.2	**rho Provided (V):**	0.004		

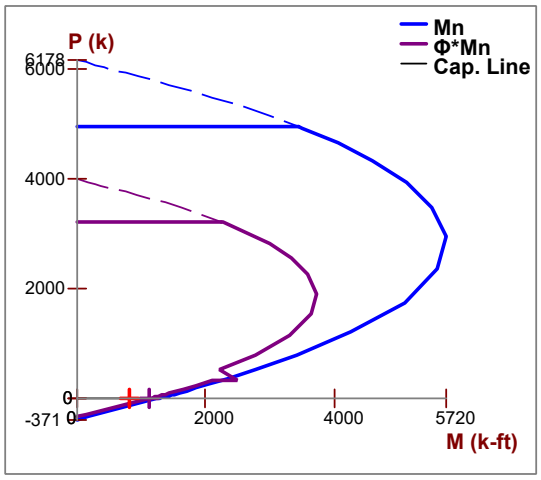
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	5.82
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

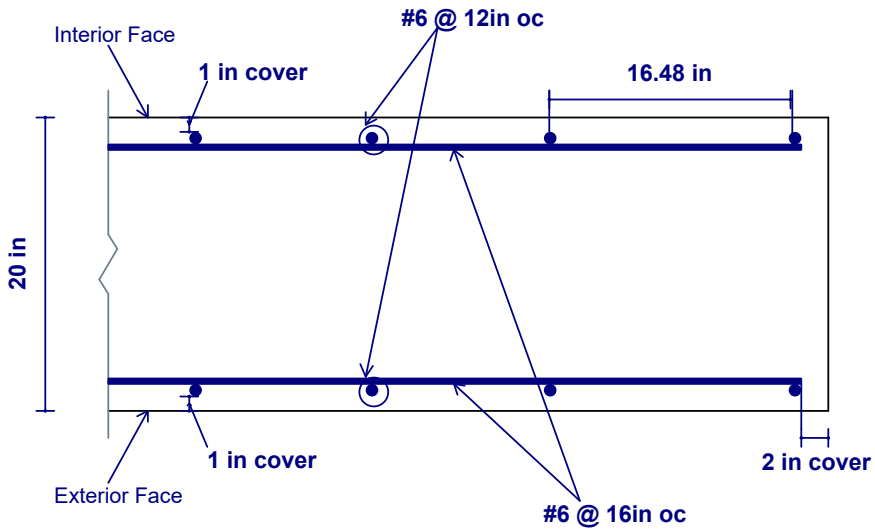
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



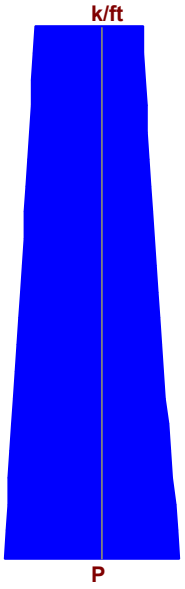
CROSS SECTION DETAILING



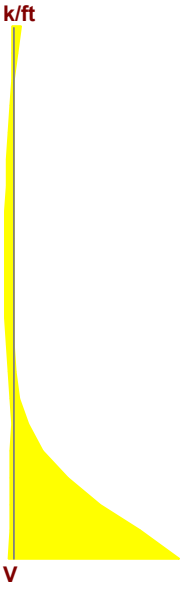
Detail Report: WP3 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	12	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

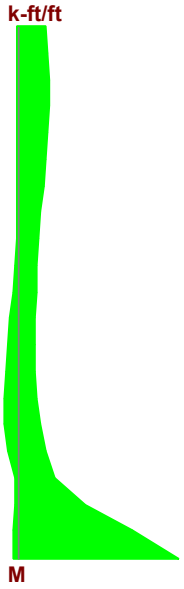
ENVELOPE DIAGRAMS



Min: -10.225 at 0 ft
Max: 12.768 at 0 ft



Min: -2.373 at 0 ft
Max: 0.108 at 6 ft



Min: -3.576 at 0 ft
Max: 0.28 at 3.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.219	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	-10.225	**UC Max Ext (+z):**	0.219	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	-46.761	**Location (ft):**	0	**Gov LC Ext (+z):**	5
Gov Mu Int (-z) (k-ft/ft):	-2.272	**Gov Pu Ext (+z) (k/ft):**	-10.225		
phi*Mn Int (-z) (k-ft/ft):	10.391	**phi*Pn Ext (+z) (k/ft):**	-46.761		

SHEAR DETAILS

UC Max:	0.112	**Gov Vu (k/ft):**	-2.373	**phi*Vns (k/ft):**	21.203
Location (ft):	0	**phi*Vnc (k/ft):**	7.673	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.041	**Location (ft):**	36.75
Deflection Ratio:	H/3535	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	6.185	**As min (V) (in^2):**	4.285
rho Provided (V):	0.004	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

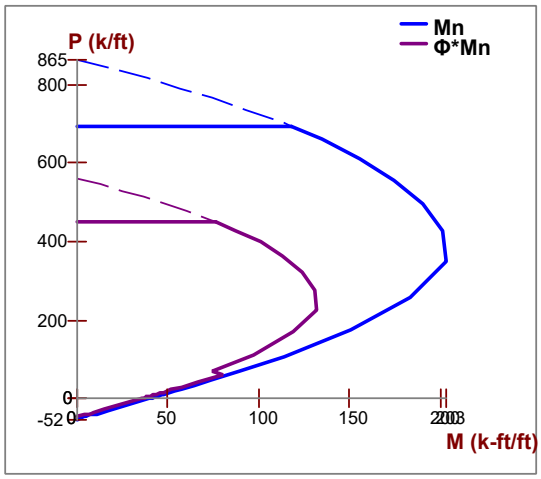
Total Width (in):	12	**Icracked (in^4):**	2800	**KL/r:**	24.942
A (in^2):	240	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	8000	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

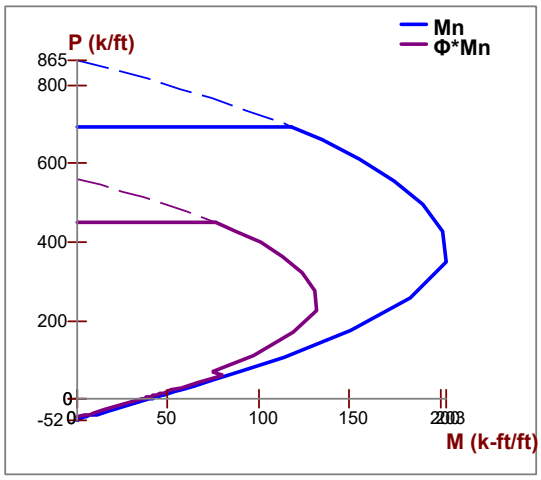
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

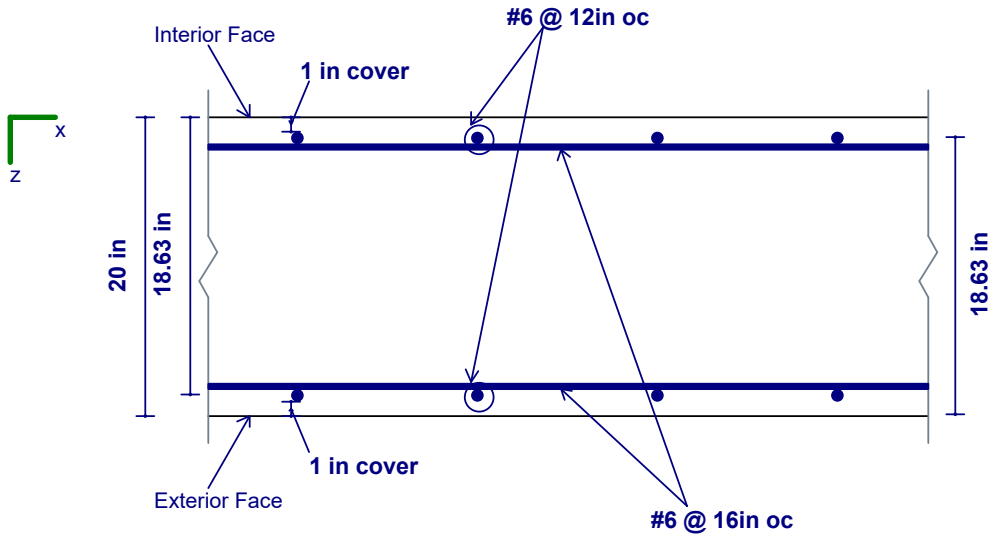
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



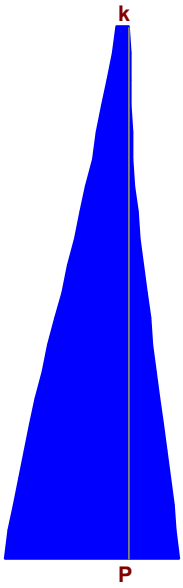
CROSS SECTION DETAILING



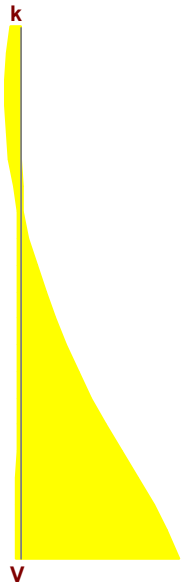
Detail Report: WP3 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

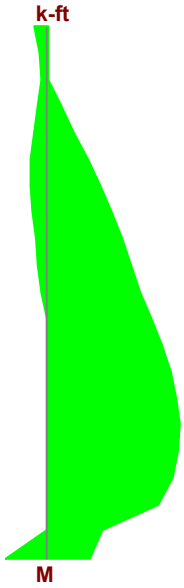
ENVELOPE DIAGRAMS



Min: -16.175 at 0 ft
Max: 39.611 at 0 ft



Min: -37.687 at 0 ft
Max: 3.481 at 11.688 ft



Min: -24.289 at 3.438 ft
Max: 7.202 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.025	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	3.438	**Gov Mu (k-ft):**	-24.289	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	983.387		

SHEAR DETAILS

UC Max:	0.097	**phi*Vn (k):**	387.798	**Vs (k):**	283.991
Location (ft):	0	**Vnmax (k):**	867.324	**Gov LC:**	5
Gov Vu (k):	-37.687	**Vc (k):**	233.073		

DEFLECTION DETAILS

Delta max (in):	0.056	**Location (ft):**	36.75
Deflection Ratio:	H/2947	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	2.571
rho Provided (H):	0.003	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	6.6	**rho Provided (V):**	0.003		

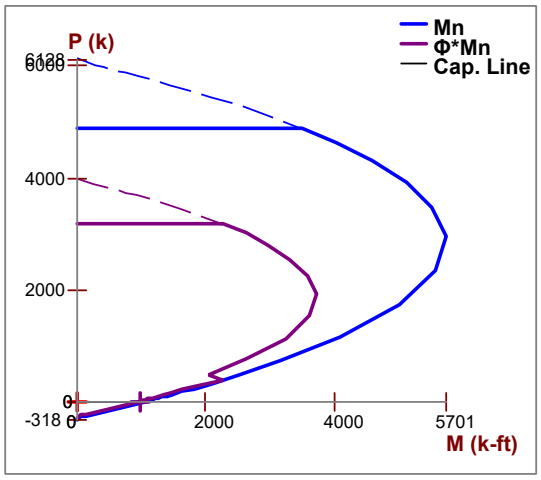
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	6.669
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

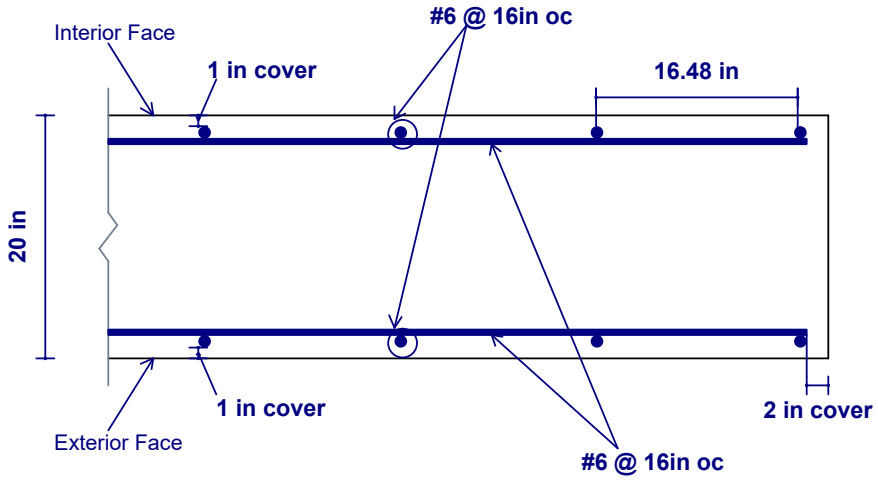
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



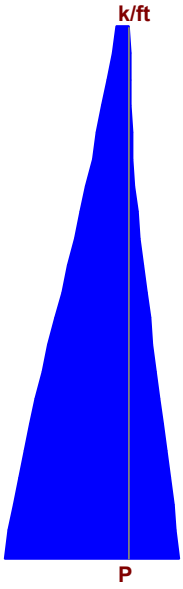
CROSS SECTION DETAILING



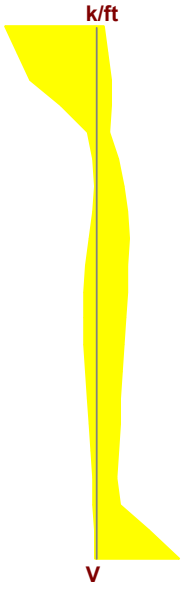
Detail Report: WP3 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

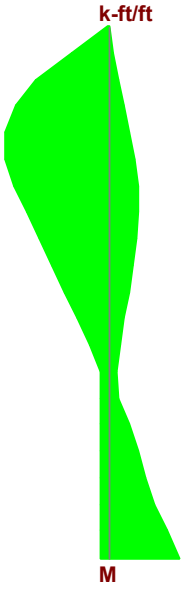
ENVELOPE DIAGRAMS



Min: -2.265 at 0 ft
Max: 5.546 at 0 ft



Min: -0.198 at 0 ft
Max: 0.219 at 13.75 ft



Min: -0.261 at 0 ft
Max: 0.383 at 10.313 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.008	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.384
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	31.274
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.012	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	10.313	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.261	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	31.274	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.026	**Gov Vu (k/ft):**	0.219	**phi*Vns (k/ft):**	0
Location (ft):	13.75	**phi*Vnc (k/ft):**	8.391	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.023	**Location (ft):**	1.837
Deflection Ratio:	H/7185	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	2.571
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

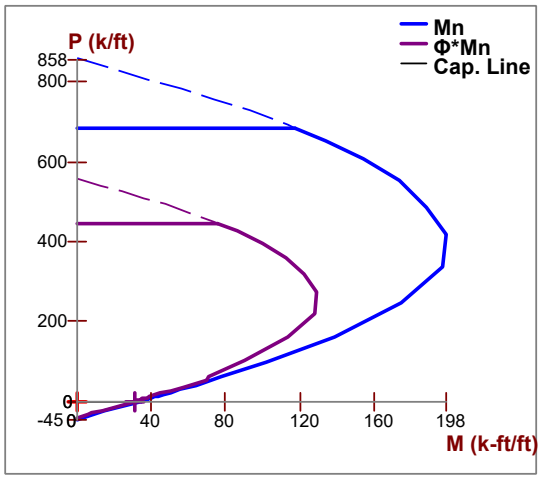
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	28.579
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

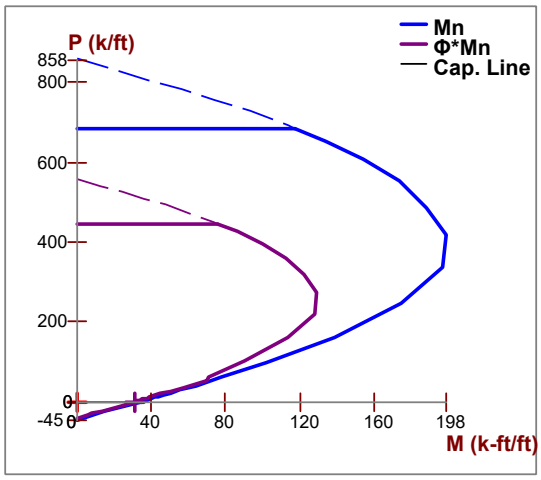
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

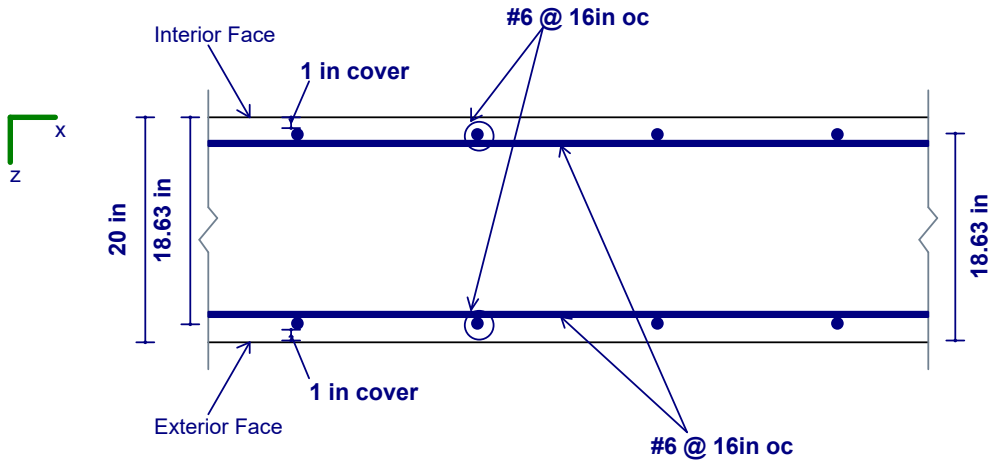
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

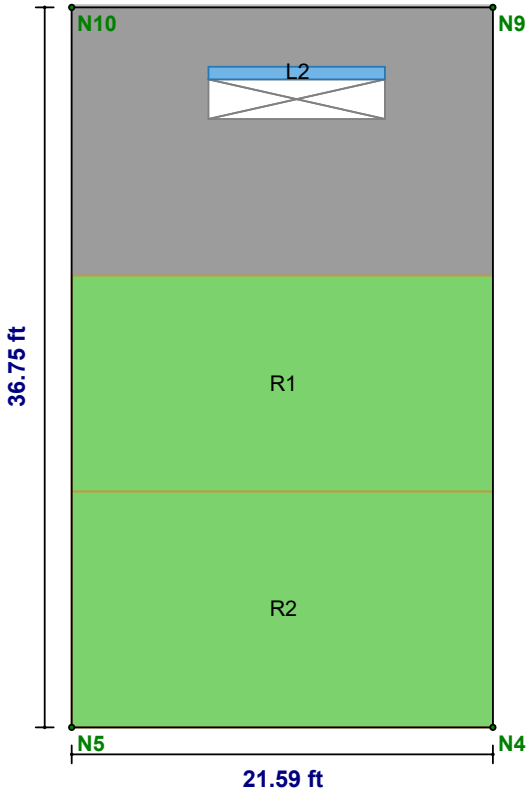


CROSS SECTION DETAILING



Detail Report: WP4

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	36.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	21.587	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.296	5	0.143	2	0.013	2	0.296	5	0.051	5	0.059	2
R2	0.607	2	0.173	2	0.011	2	0.607	2	0.222	2	0.078	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@14in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP4 (In-Plane, Opening L2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6

GEOMETRY

Total Height (ft):	2
Total Length (ft):	9
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2

MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

Note: Lintel analysis is considered only when opening has a region exactly above it.

Detail Report: WP4 (Out-of-Plane, Opening L2)

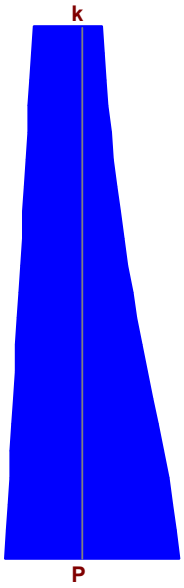
CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	9	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6			**Conc Str Blk:**	Rectangular
				Vert Bar Fy (ksi):	60
				Horz Bar Fy (ksi):	60
				Steel E (ksi):	29000

Note: Lintel analysis is considered only when opening has a region exactly above it.

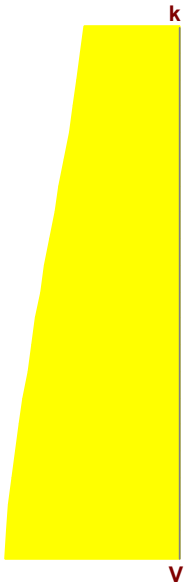
Detail Report: WP4 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	21.587	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

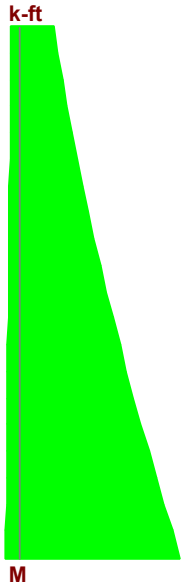
ENVELOPE DIAGRAMS



Min: -226.008 at 0 ft
Max: 173.181 at 0 ft



Min: 85.248 at 11 ft
Max: 156.561 at 0 ft



Min: -1671.681 at 0 ft
Max: 124.868 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.296	**phi*Pn (k):**	-763.407	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-1663.246	**Gov LC:**	5
Gov Pu (k):	-226.008	**phi*Mn (k-ft):**	5618.087		

SHEAR DETAILS

UC Max:	0.143	**phi*Vn (k):**	1092.906	**Vs (k):**	858.316
Location (ft):	0	**Vnmax (k):**	2621.341	**Gov LC:**	2
Gov Vu (k):	155.975	**Vc (k):**	598.892		

DEFLECTION DETAILS

Delta max (in):	0.013	**Location (ft):**	36.75
Deflection Ratio:	H/9844	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	7.771
rho Provided (H):	0.003	**As Provided (V) (in^2):**	14.137	**rho min (V):**	0.001
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

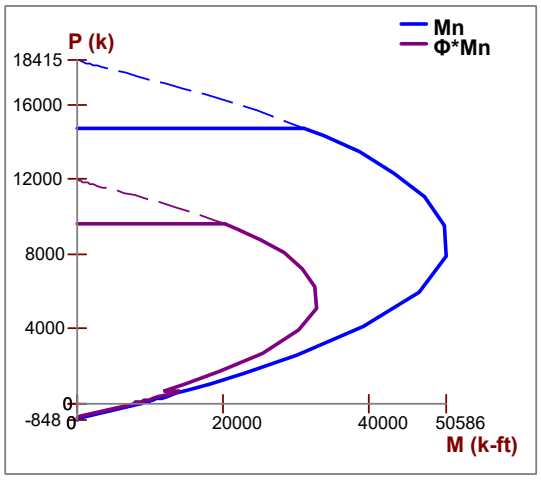
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	21.587	**Icracked (in^4):**	2.028e+7	**KL/r:**	1.765
A (in^2):	5180.88	**Cracked Mom, Mcr (k-ft):**	8841.701		
Igross (in^4):	2.897e+7	**r (in):**	62.565		

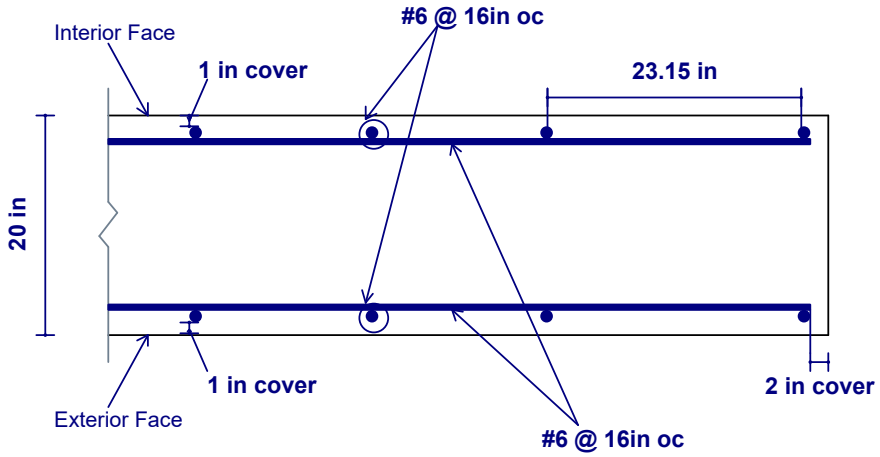
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



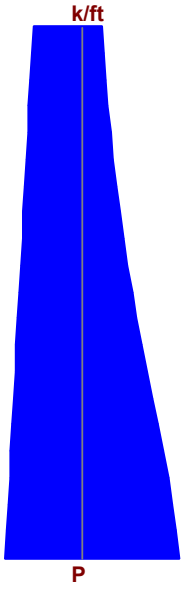
CROSS SECTION DETAILING



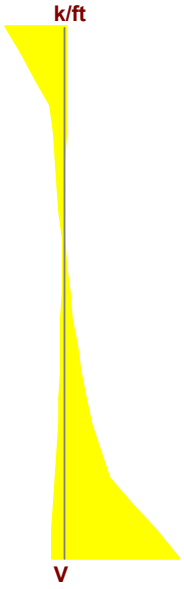
Detail Report: WP4 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	21.587	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

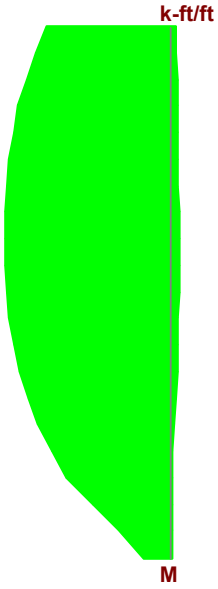
ENVELOPE DIAGRAMS



Min: -10.47 at 0 ft
Max: 8.022 at 0 ft



Min: -1.073 at 0 ft
Max: 0.528 at 11 ft



Min: -0.102 at 6.05 ft
Max: 1.986 at 6.05 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.296	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	-10.47	**UC Max Ext (+z):**	0.296	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	-35.364	**Location (ft):**	0	**Gov LC Ext (+z):**	5
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	-10.47		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	-35.364		

SHEAR DETAILS

UC Max:	0.051	**Gov Vu (k/ft):**	-1.073	**phi*Vns (k/ft):**	21.203
Location (ft):	0	**phi*Vnc (k/ft):**	6.833	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.059	**Location (ft):**	36.75
Deflection Ratio:	H/2235	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	14.137	**As min (V) (in^2):**	7.771
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

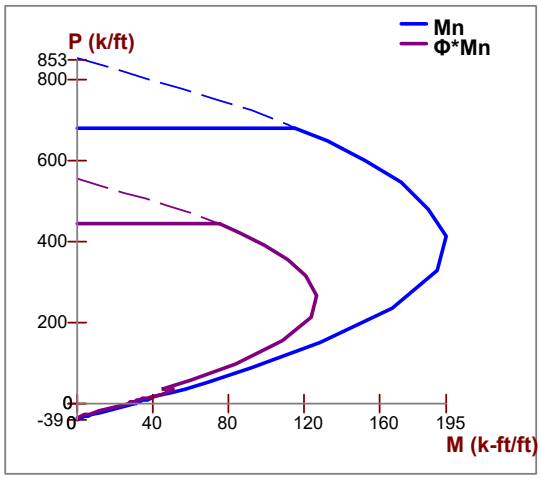
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	682.641		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

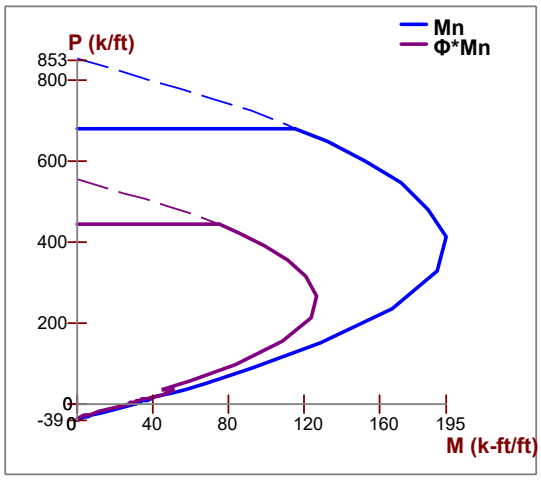
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

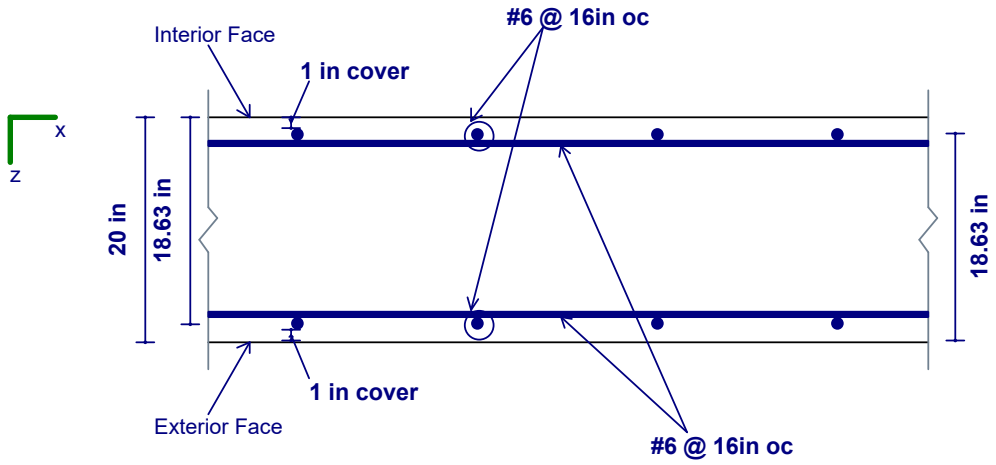
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



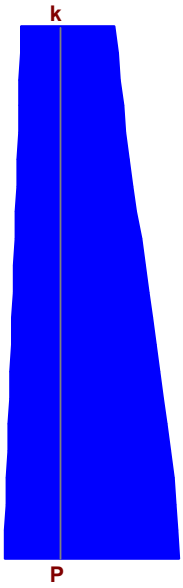
CROSS SECTION DETAILING



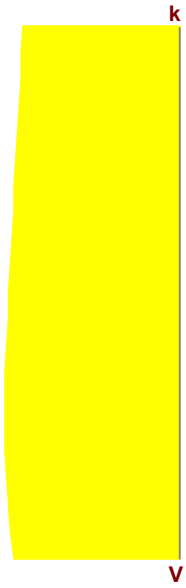
Detail Report: WP4 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	21.587	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	14	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

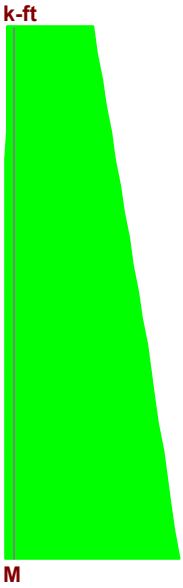
ENVELOPE DIAGRAMS



Min: -549.935 at 0 ft
Max: 251.135 at 0 ft



Min: 161.2 at 12 ft
Max: 180.242 at 3 ft



Min: -3501.091 at 0 ft
Max: 166.318 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.607	**phi*Pn (k):**	-906.546	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-3501.091	**Gov LC:**	2
Gov Pu (k):	-549.935	**phi*Mn (k-ft):**	5771.405		

SHEAR DETAILS

UC Max:	0.173	**phi*Vn (k):**	1039.042	**Vs (k):**	858.316
Location (ft):	2.4	**Vnmax (k):**	2621.341	**Gov LC:**	2
Gov Vu (k):	179.264	**Vc (k):**	527.074		

DEFLECTION DETAILS

Delta max (in):	0.011	**Location (ft):**	36.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	7.771
rho Provided (H):	0.003	**As Provided (V) (in^2):**	16.788	**rho min (V):**	0.001
As min (H) (in^2):	5.76	**rho Provided (V):**	0.003		

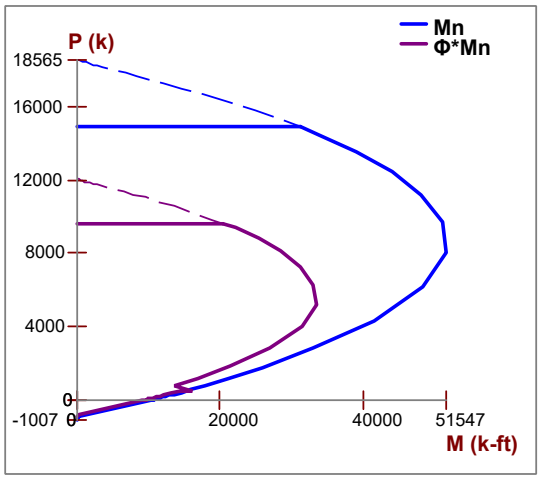
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	21.587	**Icracked (in^4):**	2.028e+7	**KL/r:**	1.926
A (in^2):	5180.88	**Cracked Mom, Mcr (k-ft):**	8841.701		
Igross (in^4):	2.897e+7	**r (in):**	62.565		

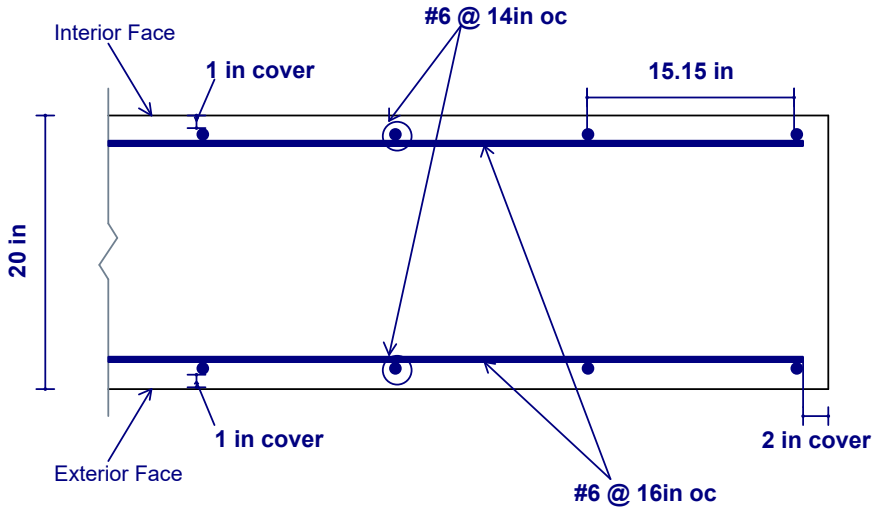
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



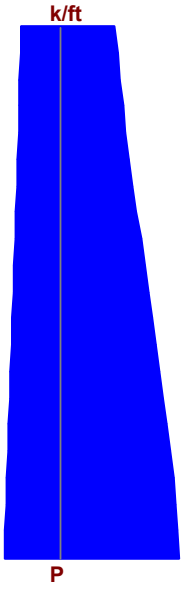
CROSS SECTION DETAILING



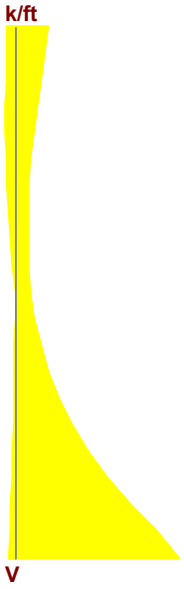
Detail Report: WP4 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	21.587	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	14	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

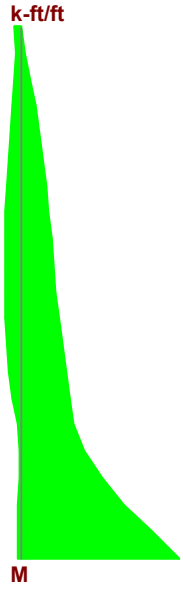
ENVELOPE DIAGRAMS



Min: -25.475 at 0 ft
Max: 11.634 at 0 ft



Min: -3.534 at 0 ft
Max: 0.176 at 9.6 ft



Min: -10.087 at 0 ft
Max: 0.974 at 6.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.607	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	-25.475	**UC Max Ext (+z):**	0.607	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	-41.995	**Location (ft):**	0	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-10.087	**Gov Pu Ext (+z) (k/ft):**	-25.475		
phi*Mn Int (-z) (k-ft/ft):	16.628	**phi*Pn Ext (+z) (k/ft):**	-41.995		

SHEAR DETAILS

UC Max:	0.222	**Gov Vu (k/ft):**	-3.534	**phi*Vns (k/ft):**	15.889
Location (ft):	0	**phi*Vnc (k/ft):**	5.561	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.078	**Location (ft):**	36.75
Deflection Ratio:	H/1839	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	16.788	**As min (V) (in^2):**	7.771
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

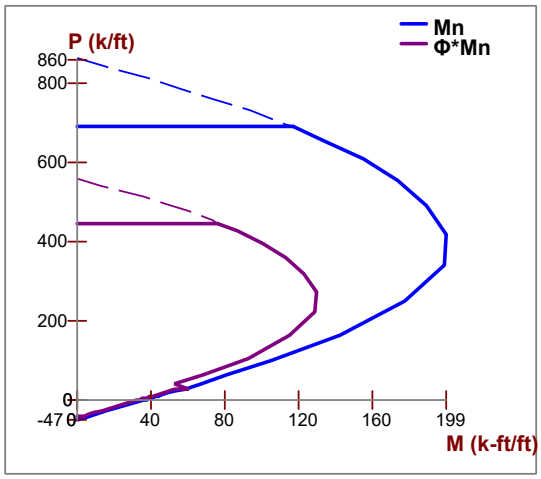
Total Width (in):	14	**Icracked (in^4):**	3266.667	**KL/r:**	24.942
A (in^2):	280	**Cracked Mom, Mcr (k-ft):**	682.641		
Igross (in^4):	9333.333	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

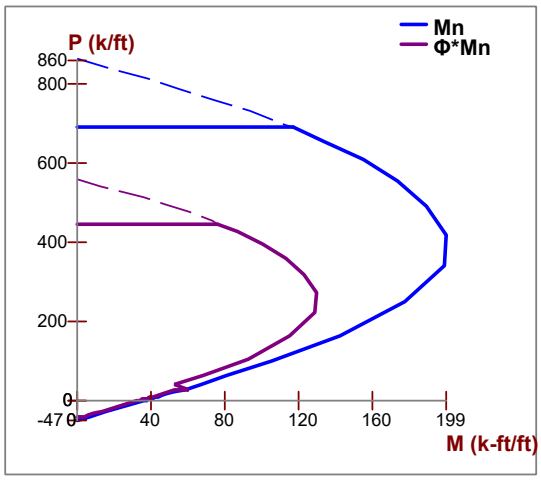
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

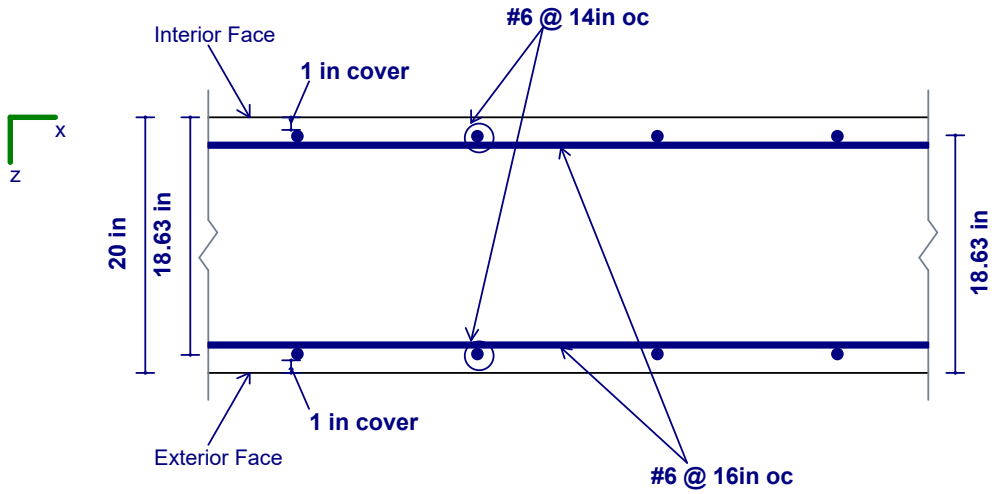
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

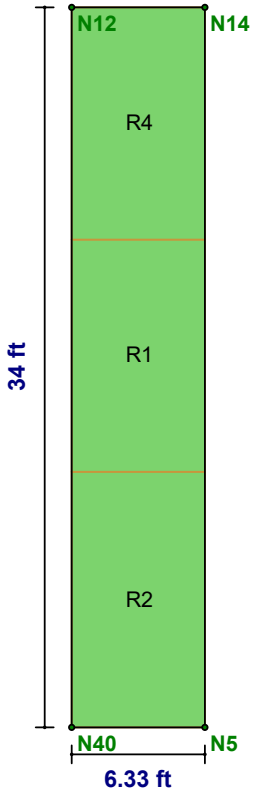


CROSS SECTION DETAILING



Detail Report: WP5

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	34	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.092	2	0.08	1	0.002	1	0.046	6	0.164	6	0.018	2
R1	0.031	1	0.039	1	0.005	1	0.031	1	0.04	5	0.011	2
R4	0.013	1	0.02	1	0.005	1	0.03	2	0.045	2	0.016	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP5 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

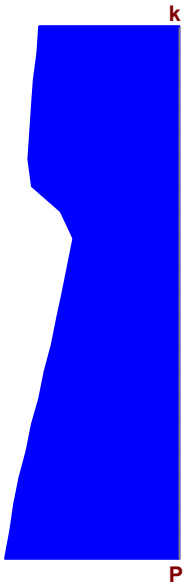
GEOMETRY

Total Height (ft):	12
Total Length (ft):	6.334
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

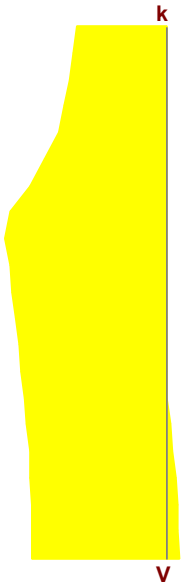
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

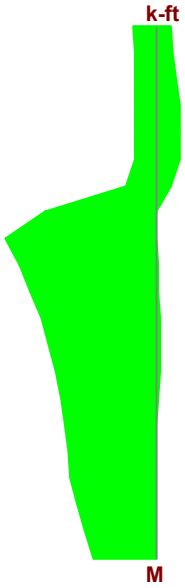
ENVELOPE DIAGRAMS



Min: 66.946 at 7.2 ft
Max: 110.78 at 0 ft



Min: -2.105 at 0 ft
Max: 27.795 at 7.2 ft



Min: -15.621 at 9 ft
Max: 96.97 at 7.2 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.092	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	7.2	**Gov Mu (k-ft):**	66.164	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	717.843		

SHEAR DETAILS

UC Max:	0.08	**phi*Vn (k):**	348.259	**Vs (k):**	251.825
Location (ft):	7.2	**Vnmax (k):**	769.086	**Gov LC:**	1
Gov Vu (k):	27.795	**Vc (k):**	212.52		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	34
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	2.28
rho Provided (H):	0.003	**As Provided (V) (in^2):**	4.418	**rho min (V):**	0.002
As min (H) (in^2):	5.76	**rho Provided (V):**	0.003		

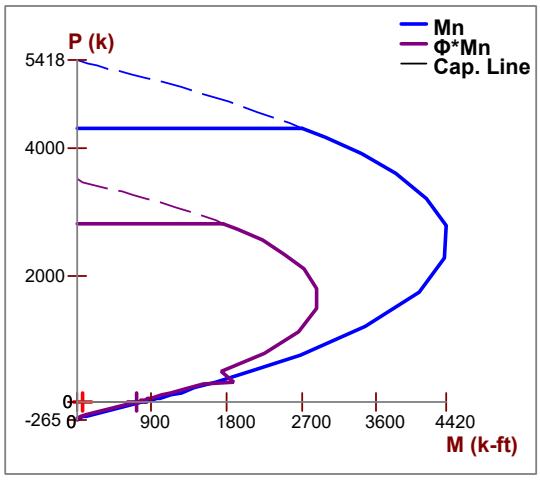
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	6.334	**Icracked (in^4):**	5.122e+5	**KL/r:**	6.563
A (in^2):	1520.04	**Cracked Mom, Mcr (k-ft):**	761.095		
Igross (in^4):	7.317e+5	**r (in):**	18.356		

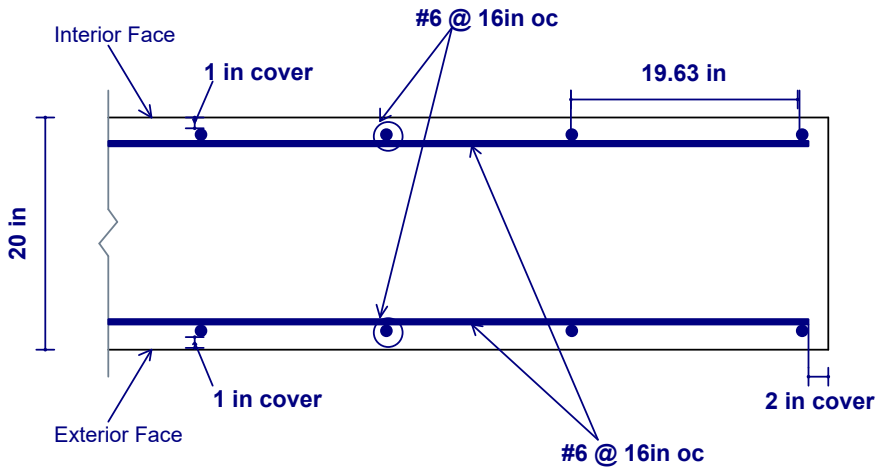
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



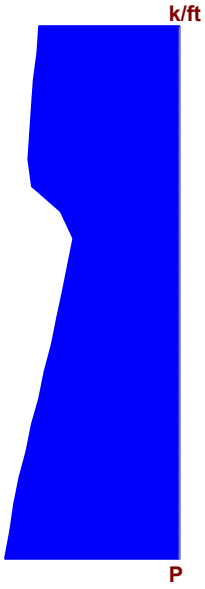
CROSS SECTION DETAILING



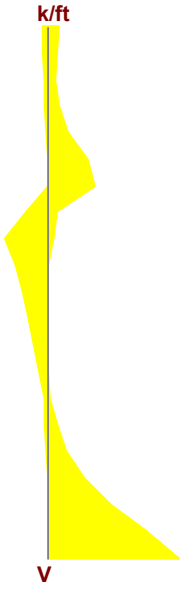
Detail Report: WP5 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

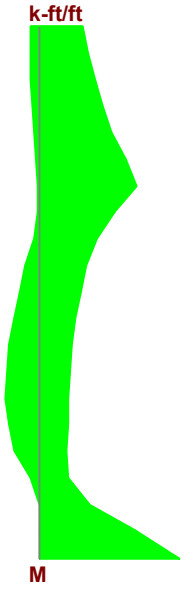
ENVELOPE DIAGRAMS



Min: 10.57 at 7.2 ft
Max: 17.491 at 0 ft



Min: -1.528 at 0 ft
Max: 0.492 at 7.2 ft



Min: -1.932 at 0 ft
Max: 0.434 at 3.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.046	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	6	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.039	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-1.346	**Gov Pu Ext (+z) (k/ft):**	17.491		
phi*Mn Int (-z) (k-ft/ft):	29.501	**phi*Pn Ext (+z) (k/ft):**	444.85		

SHEAR DETAILS

UC Max:	0.164	**Gov Vu (k/ft):**	-1.351	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.254	**Gov LC:**	6

DEFLECTION DETAILS

Delta max (in):	0.018	**Location (ft):**	32.3
Deflection Ratio:	H/8012	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	4.418	**As min (V) (in^2):**	2.28
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

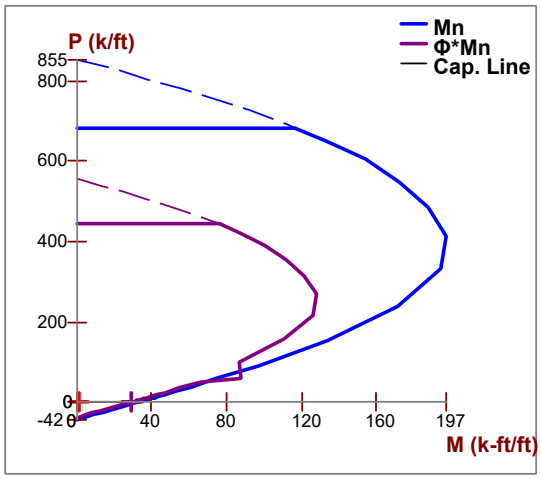
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	24.942
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	200.283		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

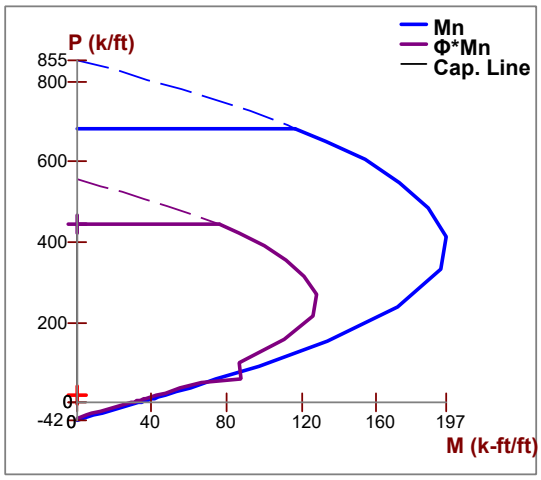
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

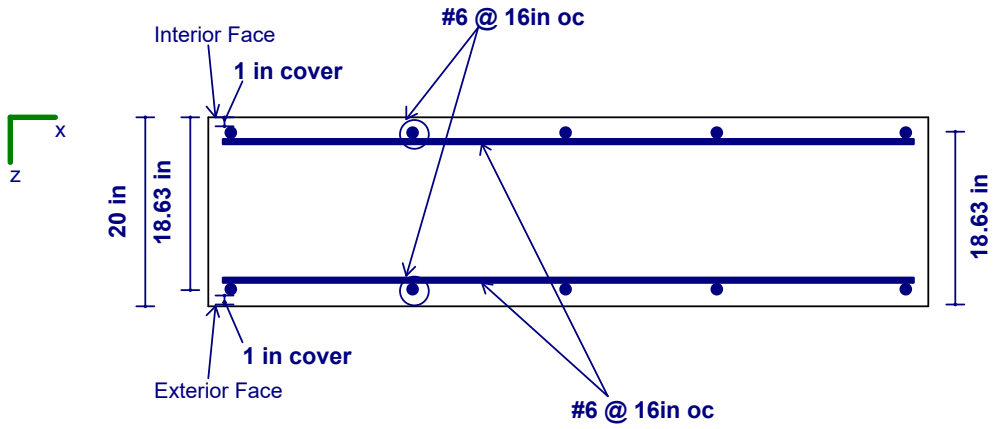
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



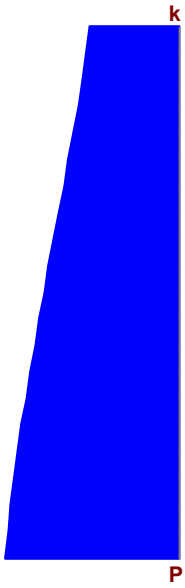
CROSS SECTION DETAILING



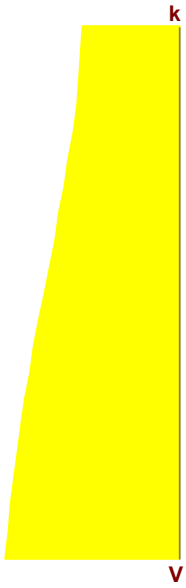
Detail Report: WP5 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

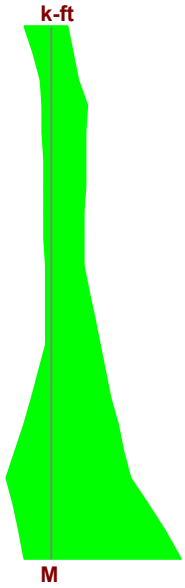
ENVELOPE DIAGRAMS



Min: 44.441 at 11 ft
Max: 87.681 at 0 ft



Min: 7.943 at 11 ft
Max: 14.328 at 0 ft



Min: -15.342 at 0 ft
Max: 5.03 at 1.65 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.031	**phi*Pn (k):**	2817.457	**phi eff.:**	0.65
Location (ft):	0	**Gov Mu (k-ft):**	-8.52	**Gov LC:**	1
Gov Pu (k):	87.681	**phi*Mn (k-ft):**	273.788		

SHEAR DETAILS

UC Max:	0.039	**phi*Vn (k):**	371.027	**Vs (k):**	251.825
Location (ft):	0	**Vnmax (k):**	769.086	**Gov LC:**	1
Gov Vu (k):	14.328	**Vc (k):**	242.878		

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	34
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	2.28
rho Provided (H):	0.003	**As Provided (V) (in^2):**	4.418	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

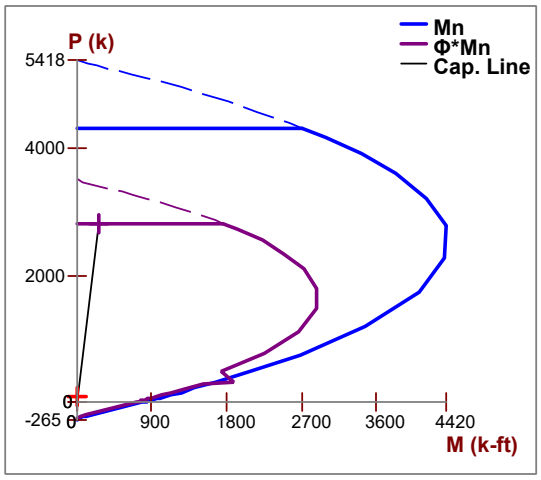
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	6.334	**Icracked (in^4):**	5.122e+5	**KL/r:**	6.016
A (in^2):	1520.04	**Cracked Mom, Mcr (k-ft):**	761.095		
Igross (in^4):	7.317e+5	**r (in):**	18.356		

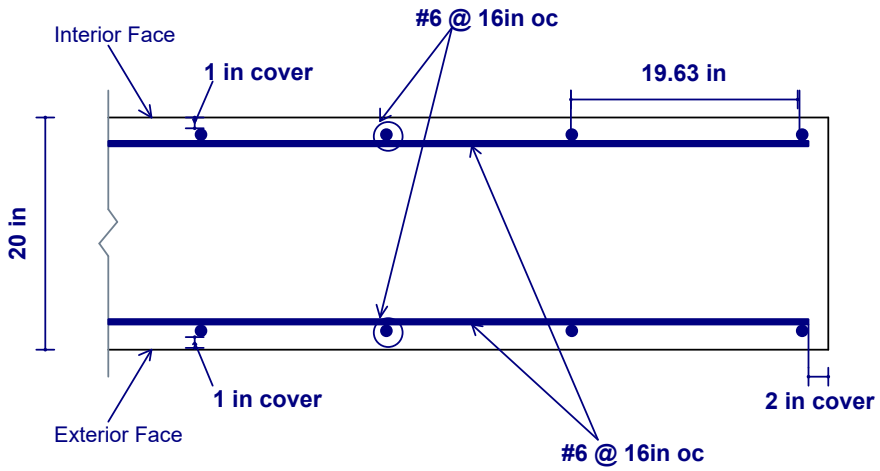
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



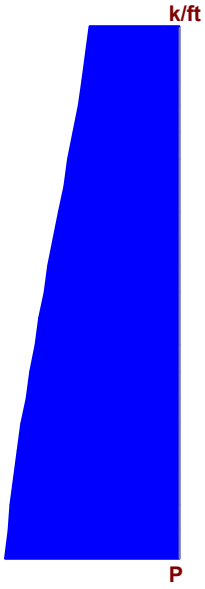
CROSS SECTION DETAILING



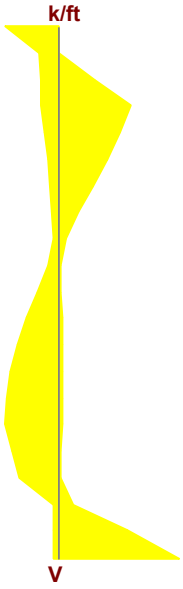
Detail Report: WP5 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

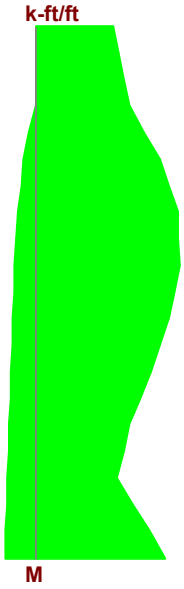
ENVELOPE DIAGRAMS



Min: 7.017 at 11 ft
Max: 13.844 at 0 ft



Min: -0.368 at 0 ft
Max: 0.163 at 11 ft



Min: -0.537 at 6.05 ft
Max: 0.107 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.031	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	13.844	**UC Max Ext (+z):**	0.031	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	444.85	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-0.403	**Gov Pu Ext (+z) (k/ft):**	13.844		
phi*Mn Int (-z) (k-ft/ft):	12.951	**phi*Pn Ext (+z) (k/ft):**	444.85		

SHEAR DETAILS

UC Max:	0.04	**Gov Vu (k/ft):**	-0.368	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	9.144	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.011	**Location (ft):**	32.3
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	4.418	**As min (V) (in^2):**	2.28
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

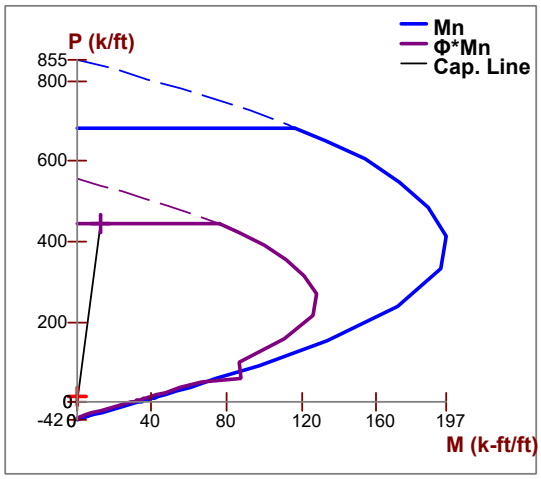
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	200.283		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

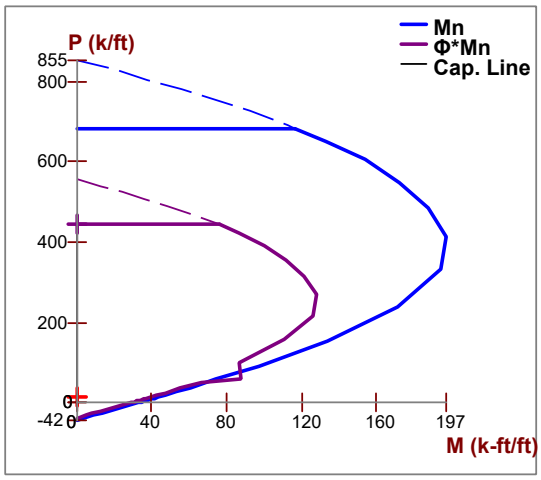
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

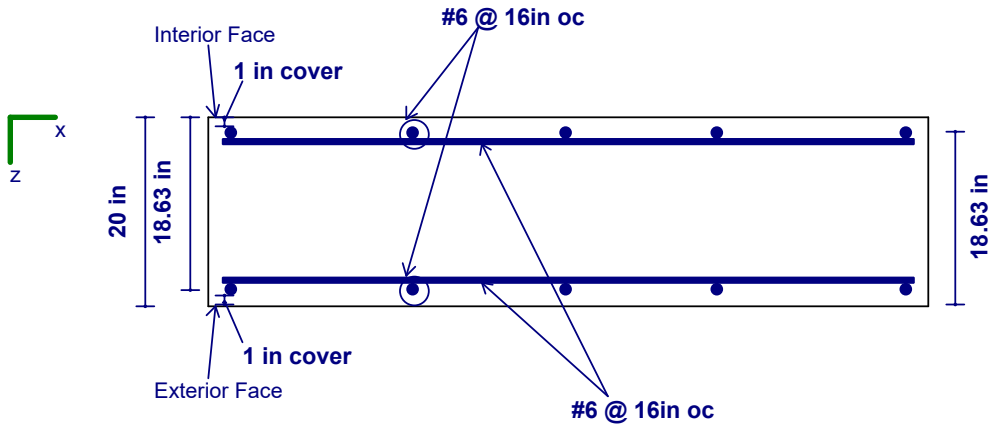
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



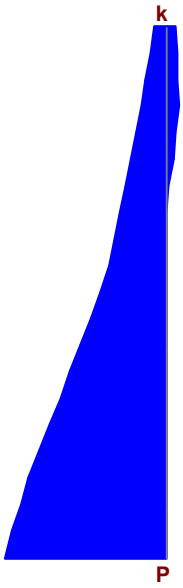
CROSS SECTION DETAILING



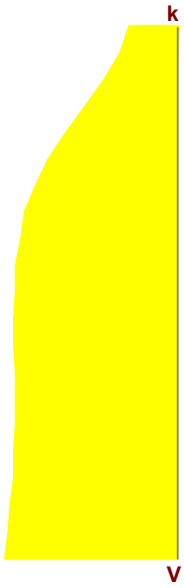
Detail Report: WP5 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

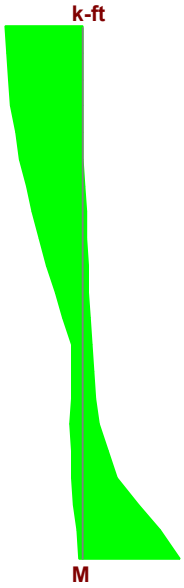
ENVELOPE DIAGRAMS



Min: -3.101 at 9.35 ft
Max: 41.433 at 0 ft



Min: -0.075 at 11 ft
Max: 7.453 at 0 ft



Min: -9.259 at 0 ft
Max: 7.069 at 11 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.013	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-9.259	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	726.789		

SHEAR DETAILS

UC Max:	0.02	**phi*Vn (k):**	371.027	**Vs (k):**	251.825
Location (ft):	0	**Vnmax (k):**	769.086	**Gov LC:**	1
Gov Vu (k):	7.453	**Vc (k):**	242.878		

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	34
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	2.28
rho Provided (H):	0.003	**As Provided (V) (in^2):**	4.418	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

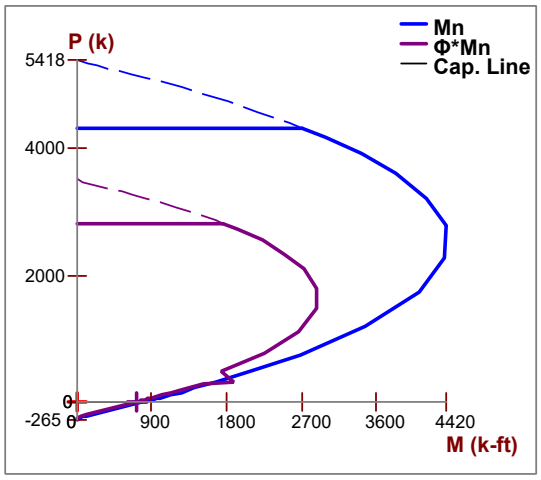
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	6.334	**Icracked (in^4):**	5.122e+5	**KL/r:**	6.016
A (in^2):	1520.04	**Cracked Mom, Mcr (k-ft):**	761.095		
Igross (in^4):	7.317e+5	**r (in):**	18.356		

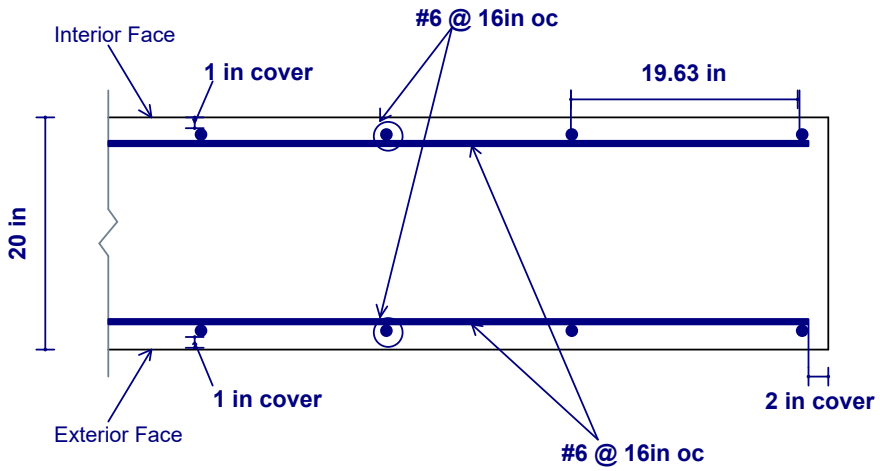
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



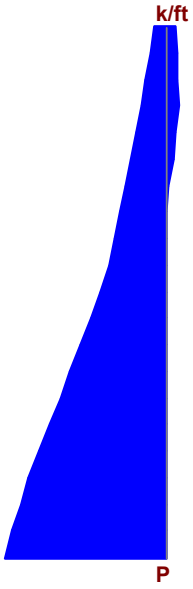
CROSS SECTION DETAILING



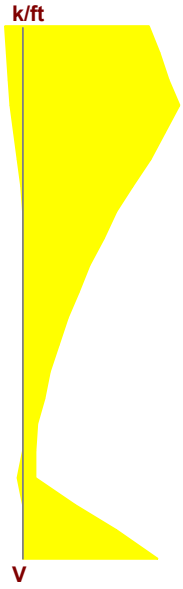
Detail Report: WP5 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

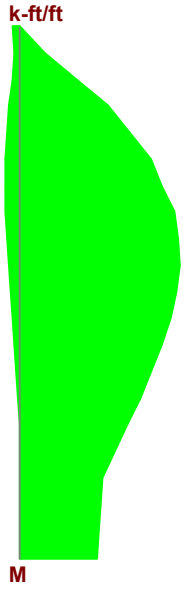
ENVELOPE DIAGRAMS



Min: -0.49 at 9.35 ft
Max: 6.542 at 0 ft



Min: -0.371 at 9.35 ft
Max: 0.04 at 11 ft



Min: -0.876 at 6.05 ft
Max: 0.068 at 8.25 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.03	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.068
Location (ft):	6.05	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z) (k-ft/ft):**	29.501
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.002	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	8.25	**Gov LC Ext (+z):**	13
Gov Mu Int (-z) (k-ft/ft):	-0.876	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	29.501	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.045	**Gov Vu (k/ft):**	-0.371	**phi*Vns (k/ft):**	0
Location (ft):	9.35	**phi*Vnc (k/ft):**	8.166	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.016	**Location (ft):**	1.7
Deflection Ratio:	H/8230	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	4.418	**As min (V) (in^2):**	2.28
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

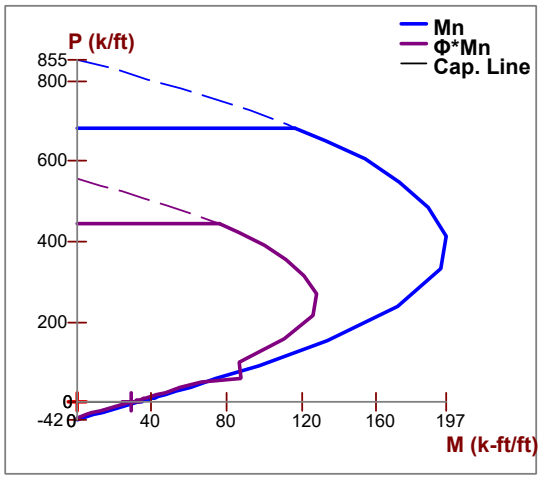
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	200.283		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

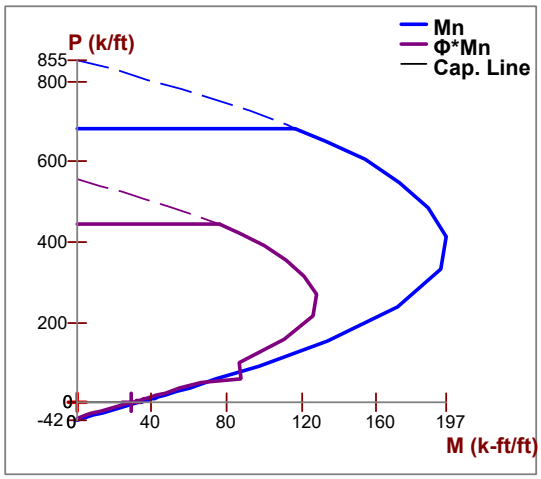
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

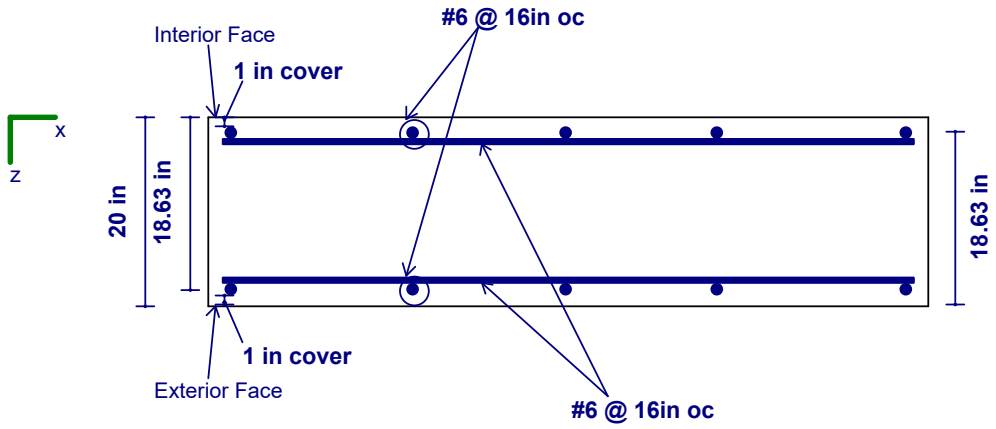
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

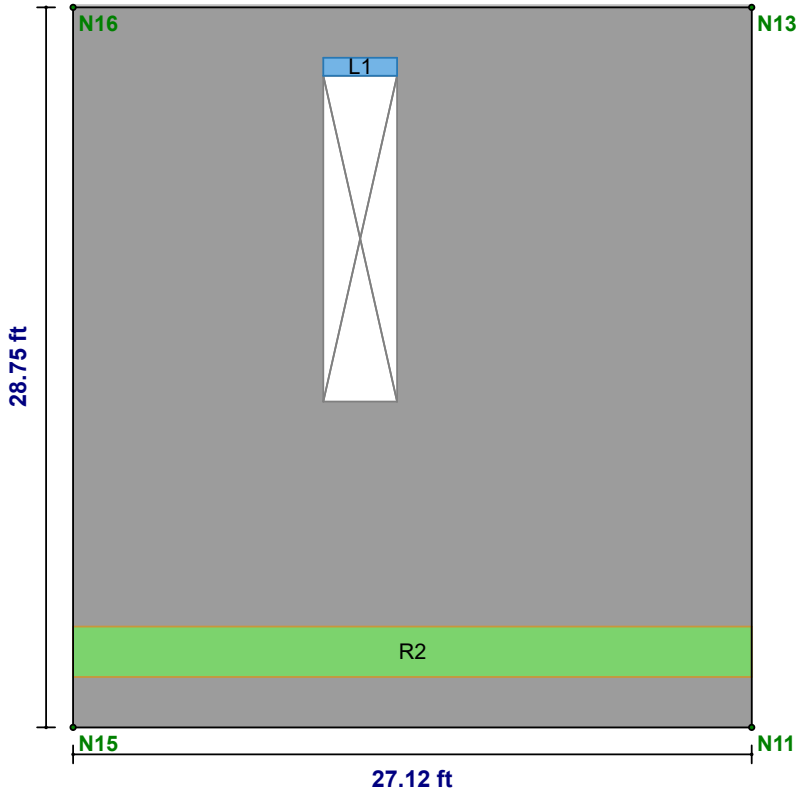


CROSS SECTION DETAILING



Detail Report: WP6

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	28.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	27.124	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.091	1	0.086	1	0.001	1	0.084	5	0.128	2	0.005	5

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP6 (In-Plane, Opening L1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6

GEOMETRY

Total Height (ft):	13
Total Length (ft):	3
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2

MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

Note: Lintel analysis is considered only when opening has a region exactly above it.

Detail Report: WP6 (Out-of-Plane, Opening L1)

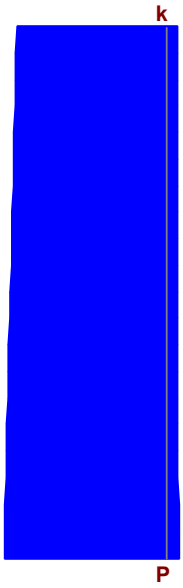
CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6			**Conc Str Blk:**	Rectangular
				Vert Bar Fy (ksi):	60
				Horz Bar Fy (ksi):	60
				Steel E (ksi):	29000

Note: Lintel analysis is considered only when opening has a region exactly above it.

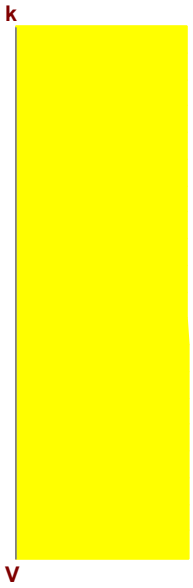
Detail Report: WP6 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	27.124	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

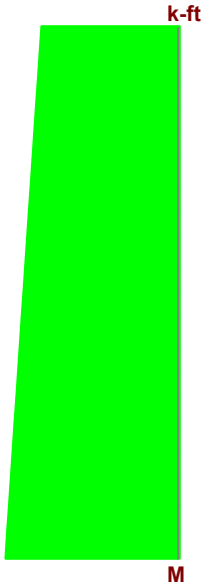
ENVELOPE DIAGRAMS



Min: -18.631 at 0 ft
Max: 252.996 at 0 ft



Min: -149.448 at 0 ft
Max: -147.666 at 2 ft



Min: -14.099 at 2 ft
Max: 1175.397 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.091	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	1175.397	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	12969.356		

SHEAR DETAILS

UC Max:	0.086	**phi*Vn (k):**	1735.209	**Vs (k):**	1078.471
Location (ft):	0	**Vnmax (k):**	3293.707	**Gov LC:**	1
Gov Vu (k):	-149.448	**Vc (k):**	1235.14		

DEFLECTION DETAILS

Delta max (in):	0.0007118	**Location (ft):**	28.75
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	3.534	**rho min (H):**	0.002	**As min (V) (in^2):**	9.765
rho Provided (H):	0.007	**As Provided (V) (in^2):**	18.555	**rho min (V):**	0.002
As min (H) (in^2):	0.96	**rho Provided (V):**	0.003		

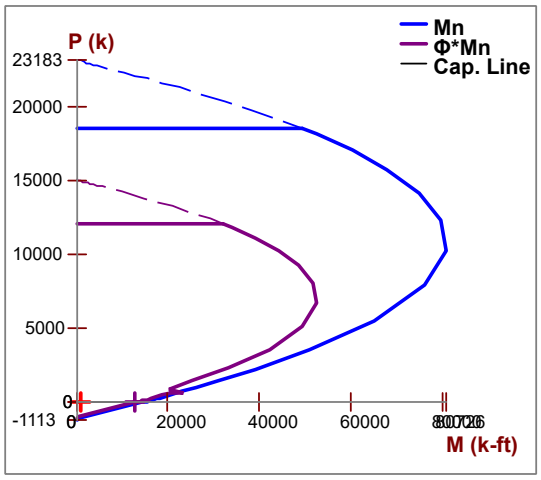
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	27.124	**Icracked (in^4):**	4.023e+7	**KL/r:**	0.255
A (in^2):	6509.76	**Cracked Mom, Mcr (k-ft):**	13959.142		
Igross (in^4):	5.747e+7	**r (in):**	78.613		

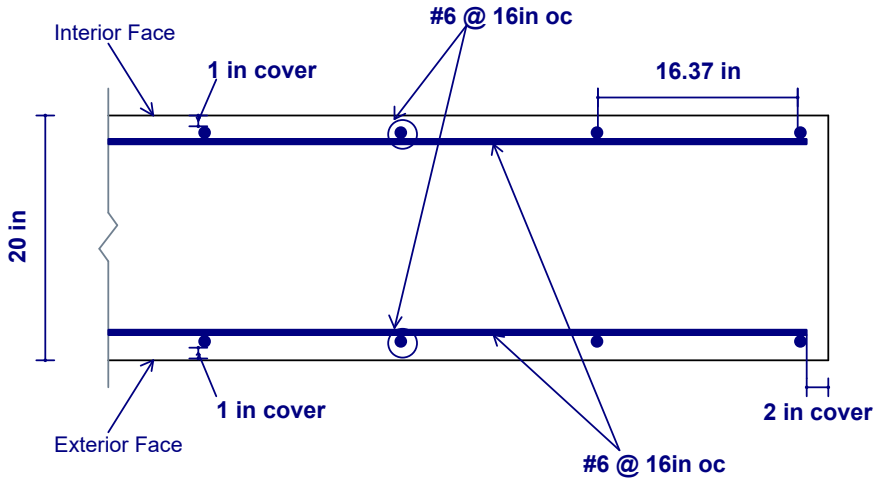
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



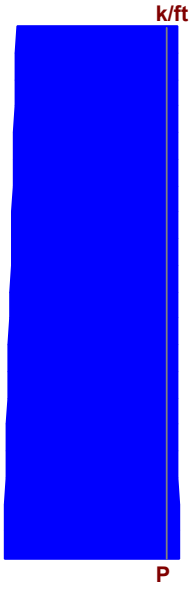
CROSS SECTION DETAILING



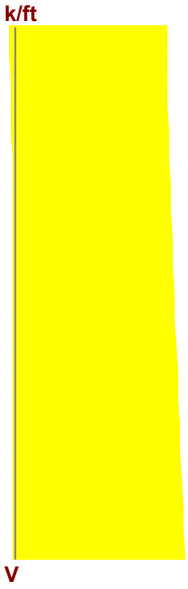
Detail Report: WP6 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	27.124	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

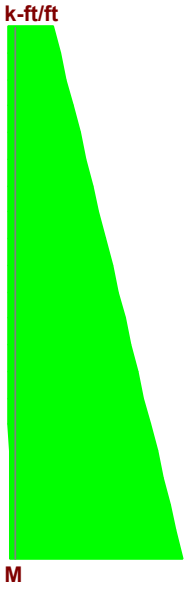
ENVELOPE DIAGRAMS



Min: -0.687 at 0 ft
Max: 9.327 at 0 ft



Min: -1.045 at 0 ft
Max: 0.026 at 2 ft



Min: -2.443 at 0 ft
Max: 0.08 at 2 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.084	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.08
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	28.967
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.003	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	2	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-2.443	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	28.967	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.128	**Gov Vu (k/ft):**	-1.039	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.094	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	14.375
Deflection Ratio:	H/4728	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (V) (in^2):	18.555	**As min (V) (in^2):**	9.765
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

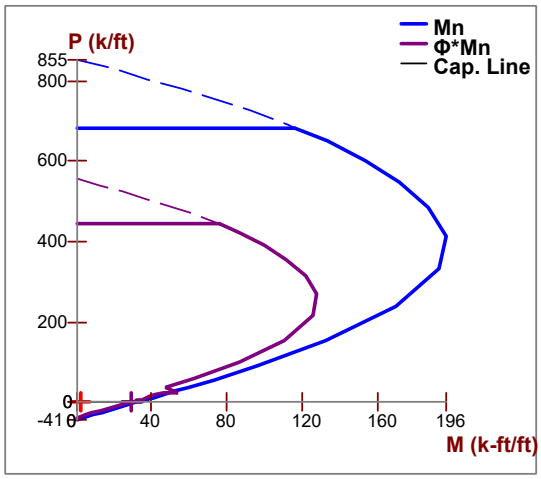
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	4.157
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	857.736		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

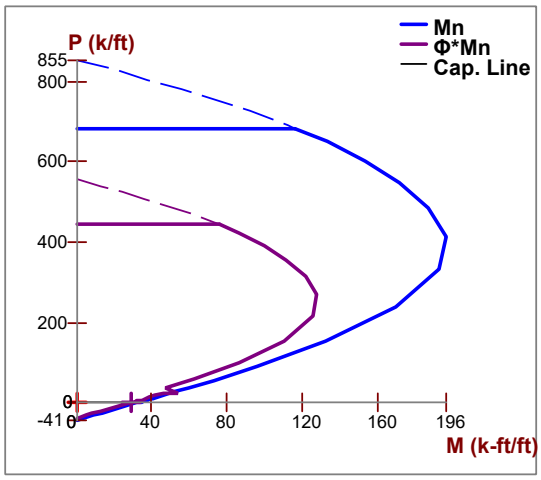
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

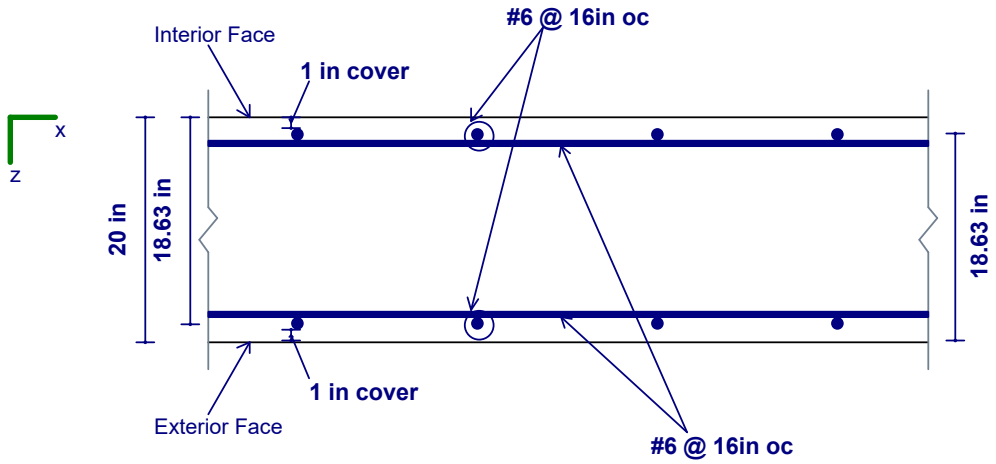
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

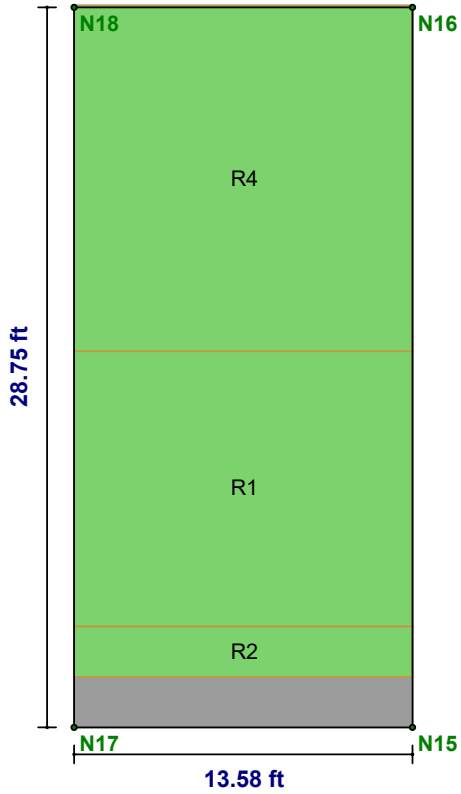


CROSS SECTION DETAILING



Detail Report: WP7

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	28.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.048	2	0.032	2	0.002	2	0.09	2	0.203	5	0.025	1
R2	0.061	2	0.033	2	0	2	0.172	5	0.214	2	0.03	1
R4	0.012	1	0.008	5	0.002	1	0.061	5	0.04	2	0.029	1

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP7 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

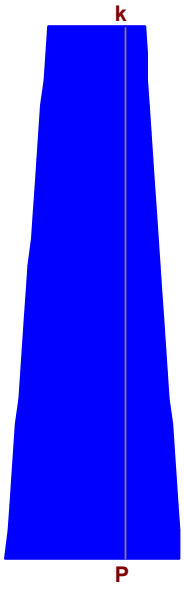
GEOMETRY

Total Height (ft):	11
Total Length (ft):	13.583
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

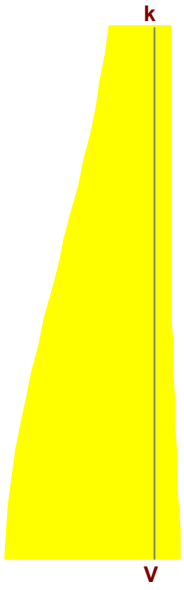
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

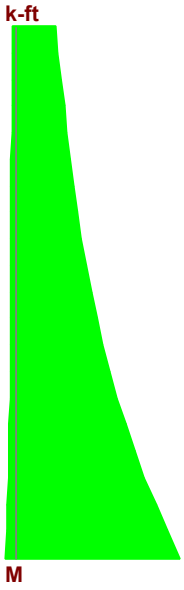
ENVELOPE DIAGRAMS



Min: -51.555 at 0 ft
Max: 110.805 at 0 ft



Min: -4.822 at 0 ft
Max: 28.083 at 0 ft



Min: -150.699 at 0 ft
Max: 8.116 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.048	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-150.699	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	3134.293		

SHEAR DETAILS

UC Max:	0.032	**phi*Vn (k):**	868.948	**Vs (k):**	540.071
Location (ft):	0	**Vnmax (k):**	1649.404	**Gov LC:**	2
Gov Vu (k):	28.083	**Vc (k):**	618.526		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	28.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	4.89
rho Provided (H):	0.003	**As Provided (V) (in^2):**	8.836	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

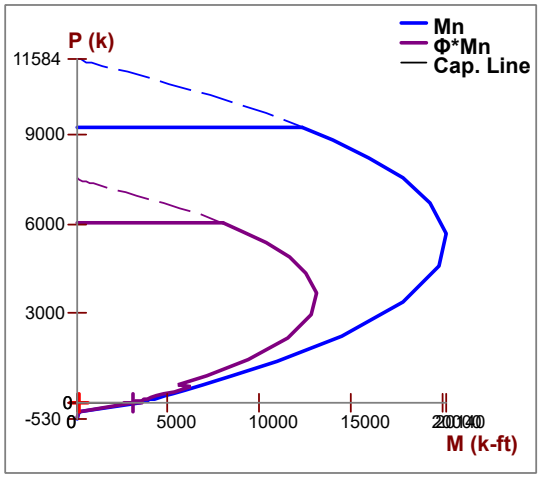
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	13.583	**Icracked (in^4):**	5.052e+6	**KL/r:**	2.805
A (in^2):	3259.92	**Cracked Mom, Mcr (k-ft):**	3500.601		
Igross (in^4):	7.217e+6	**r (in):**	39.367		

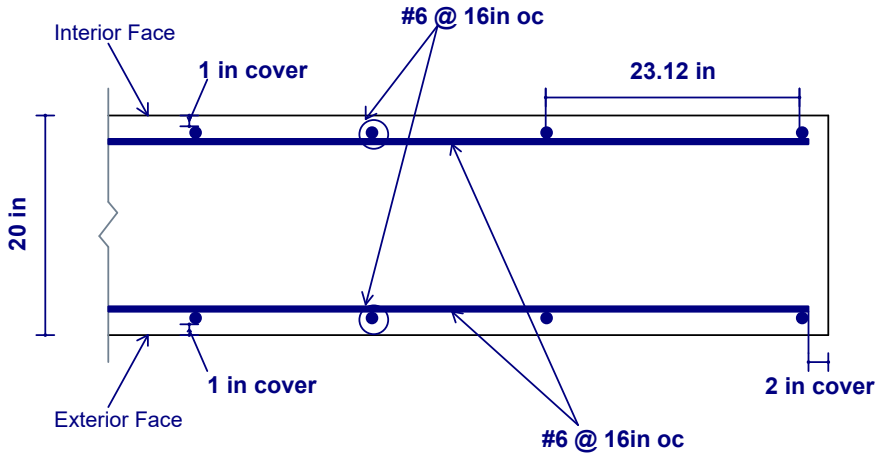
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



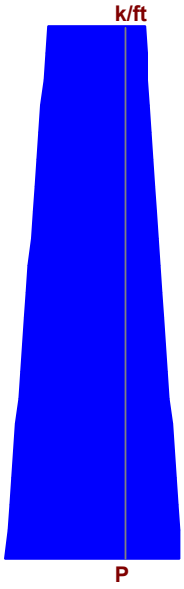
CROSS SECTION DETAILING



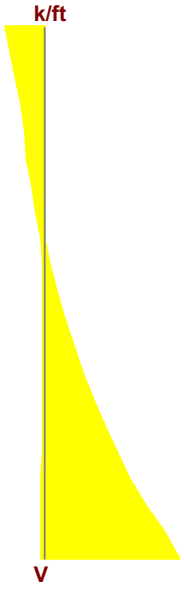
Detail Report: WP7 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

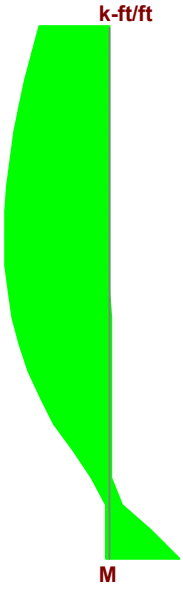
ENVELOPE DIAGRAMS



Min: -3.796 at 0 ft
Max: 8.158 at 0 ft



Min: -1.544 at 0 ft
Max: 0.429 at 11 ft



Min: -1.687 at 0 ft
Max: 2.483 at 6.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.061	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	2.483
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	27.633
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.09	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	7.15	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-1.687	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	27.633	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.203	**Gov Vu (k/ft):**	-1.544	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	7.598	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.025	**Location (ft):**	27.312
Deflection Ratio:	H/5199	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	8.836	**As min (V) (in^2):**	4.89
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

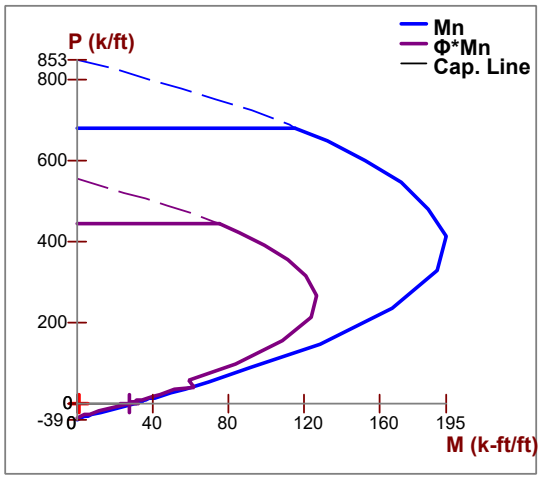
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	429.532		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

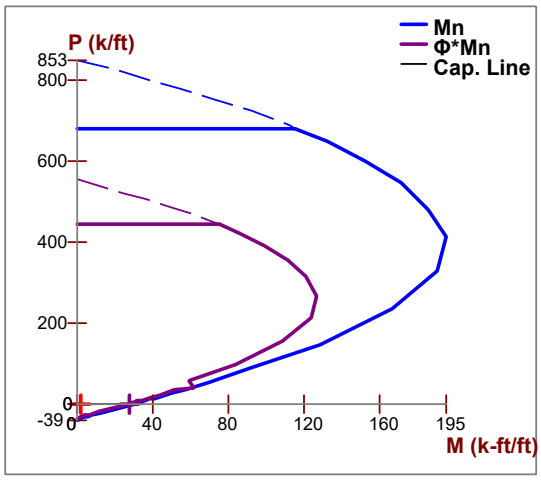
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

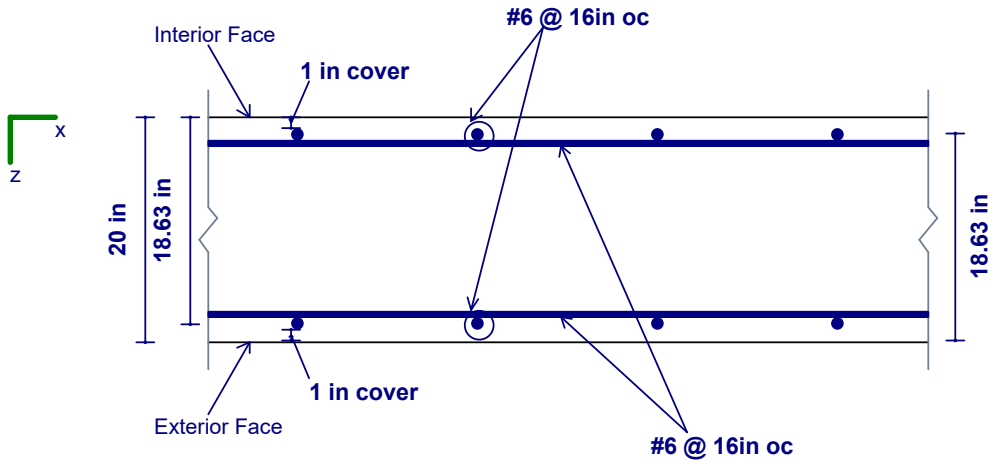
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



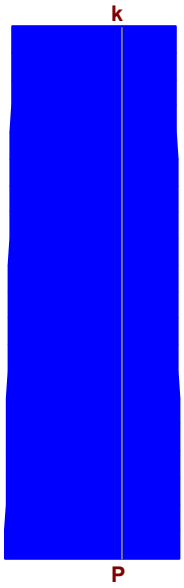
CROSS SECTION DETAILING



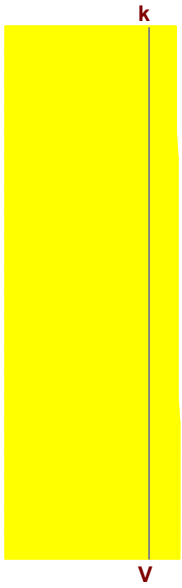
Detail Report: WP7 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

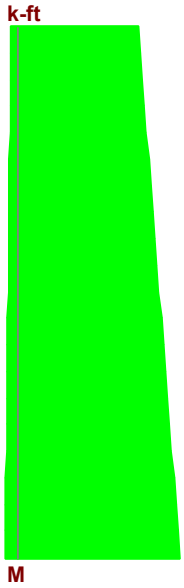
ENVELOPE DIAGRAMS



Min: -59.287 at 0 ft
Max: 117.973 at 0 ft



Min: -6.198 at 0 ft
Max: 28.65 at 2 ft



Min: -191.166 at 0 ft
Max: 12.698 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.061	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-191.166	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	3134.293		

SHEAR DETAILS

UC Max:	0.033	**phi*Vn (k):**	868.948	**Vs (k):**	540.071
Location (ft):	2	**Vnmax (k):**	1649.404	**Gov LC:**	2
Gov Vu (k):	28.65	**Vc (k):**	618.526		

DEFLECTION DETAILS

Delta max (in):	0.0003459	**Location (ft):**	28.75
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	3.534	**rho min (H):**	0.002	**As min (V) (in^2):**	4.89
rho Provided (H):	0.007	**As Provided (V) (in^2):**	8.836	**rho min (V):**	0.002
As min (H) (in^2):	0.96	**rho Provided (V):**	0.003		

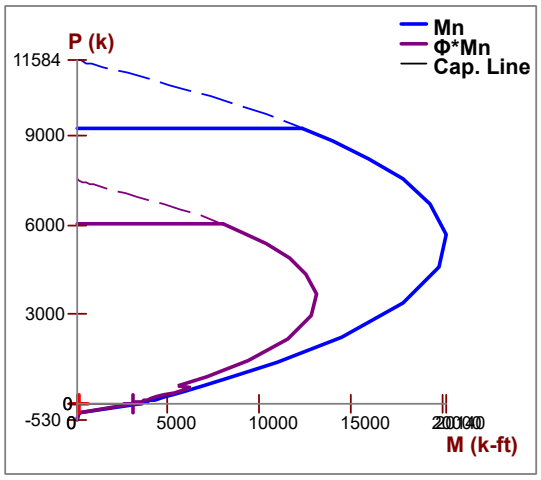
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	13.583	**Icracked (in^4):**	5.052e+6	**KL/r:**	0.51
A (in^2):	3259.92	**Cracked Mom, Mcr (k-ft):**	3500.601		
Igross (in^4):	7.217e+6	**r (in):**	39.367		

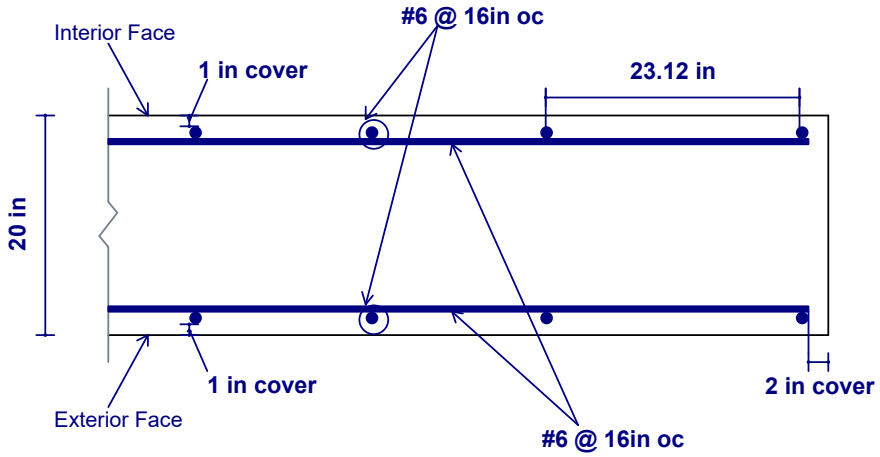
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



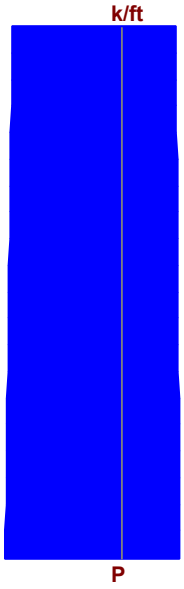
CROSS SECTION DETAILING



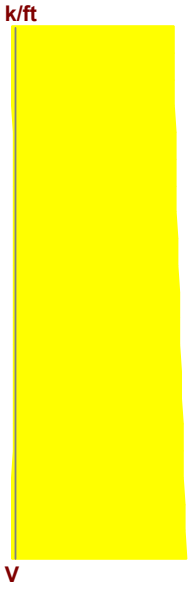
Detail Report: WP7 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

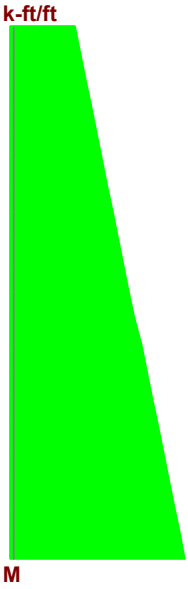
ENVELOPE DIAGRAMS



Min: -4.365 at 0 ft
Max: 8.685 at 0 ft



Min: -1.61 at 0 ft
Max: 0.025 at 2 ft



Min: -4.744 at 0 ft
Max: 0.059 at 2 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.172	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.059
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	27.633
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.002	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	2	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-4.744	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	27.633	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.214	**Gov Vu (k/ft):**	-1.61	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	7.526	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.03	**Location (ft):**	27.312
Deflection Ratio:	H/791	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	8.836	**As min (V) (in^2):**	4.89
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

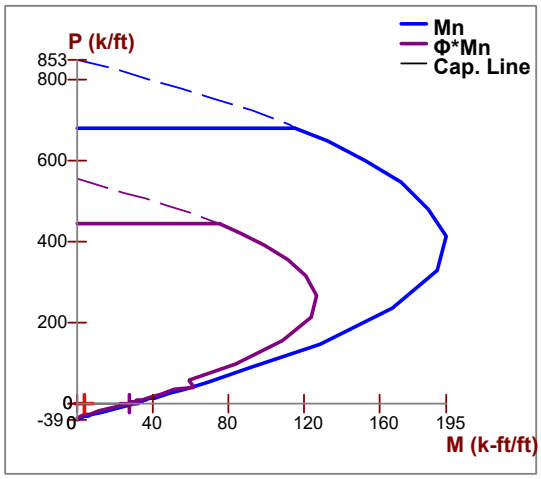
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	4.157
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	429.532		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

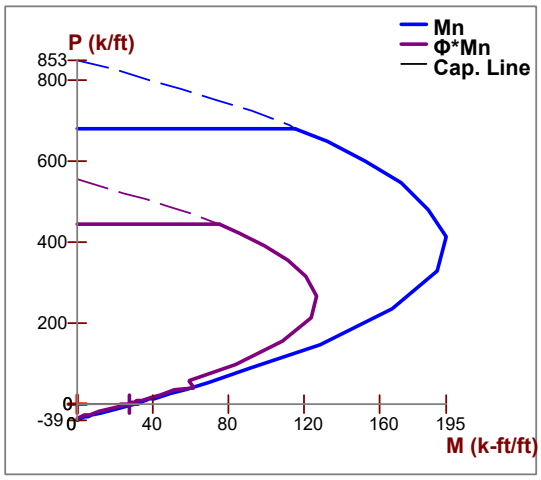
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

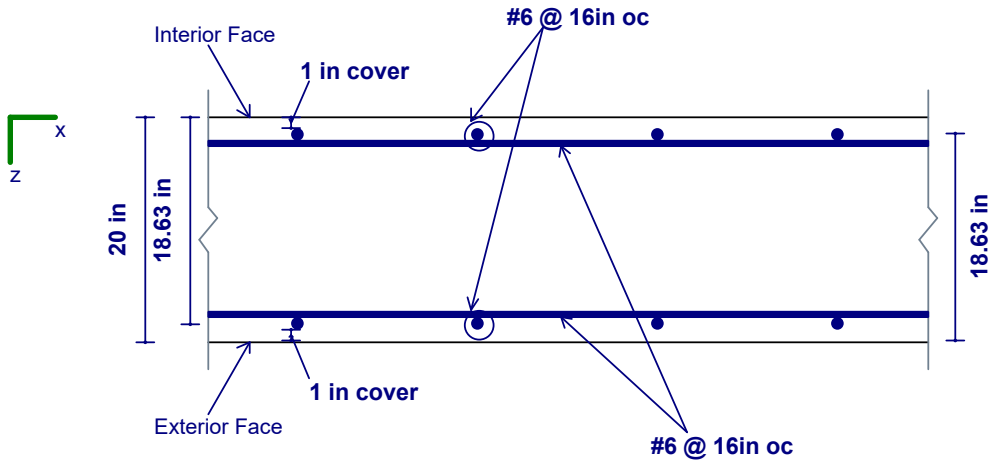
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



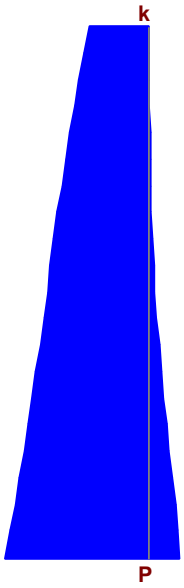
CROSS SECTION DETAILING



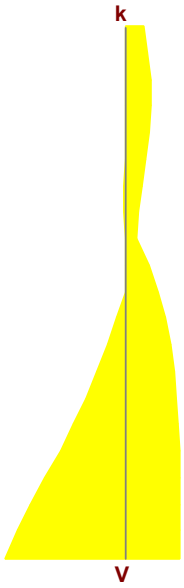
Detail Report: WP7 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

ENVELOPE DIAGRAMS



Min: -15.882 at 0 ft
Max: 71.828 at 0 ft



Min: -3.021 at 0 ft
Max: 6.564 at 0 ft

Min: -37.282 at 0 ft
Max: 2.073 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.012	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-37.282	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	3134.293		

SHEAR DETAILS

UC Max:	0.008	**phi*Vn (k):**	868.948	**Vs (k):**	540.071
Location (ft):	0	**Vnmax (k):**	1649.404	**Gov LC:**	5
Gov Vu (k):	6.564	**Vc (k):**	618.526		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	28.75
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	4.89
rho Provided (H):	0.003	**As Provided (V) (in^2):**	8.836	**rho min (V):**	0.002
As min (H) (in^2):	6.6	**rho Provided (V):**	0.003		

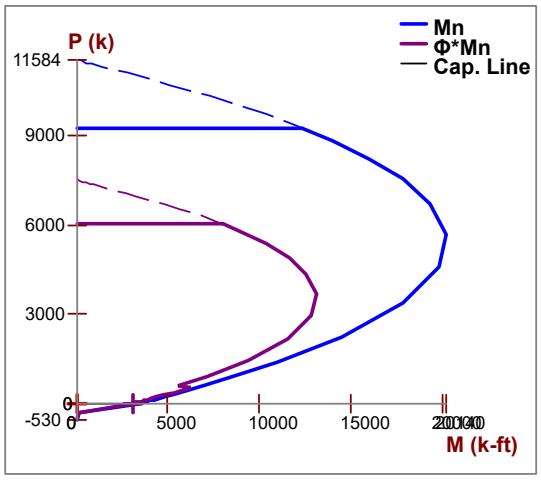
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	13.583	**Icracked (in^4):**	5.052e+6	**KL/r:**	3.507
A (in^2):	3259.92	**Cracked Mom, Mcr (k-ft):**	3500.601		
Igross (in^4):	7.217e+6	**r (in):**	39.367		

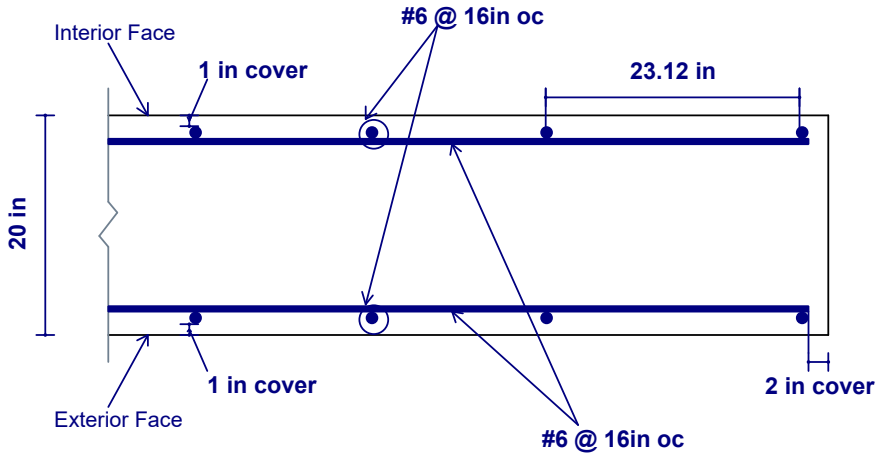
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



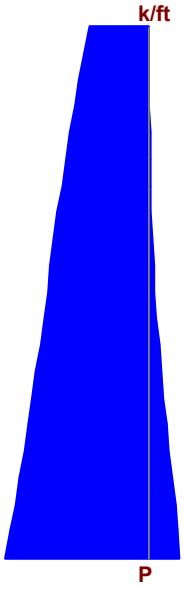
CROSS SECTION DETAILING



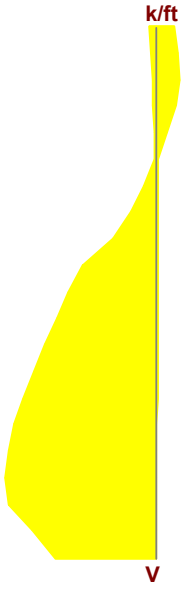
Detail Report: WP7 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13.75	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	13.583	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

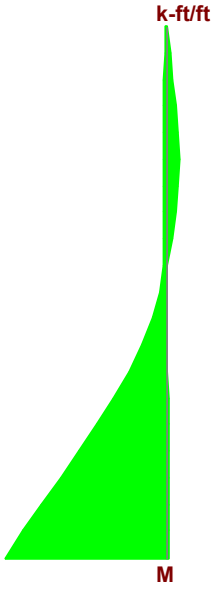
ENVELOPE DIAGRAMS



Min: -1.169 at 0 ft
Max: 5.288 at 0 ft



Min: -0.052 at 12.375 ft
Max: 0.321 at 2.063 ft



Min: -0.125 at 10.313 ft
Max: 1.695 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.005	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	1.695
Location (ft):	10.312	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z) (k-ft/ft):**	27.633
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.061	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	5
Gov Mu Int (-z) (k-ft/ft):	-0.125	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	27.633	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.04	**Gov Vu (k/ft):**	0.321	**phi*Vns (k/ft):**	0
Location (ft):	2.062	**phi*Vnc (k/ft):**	7.931	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.029	**Location (ft):**	1.438
Deflection Ratio:	H/5611	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	8.836	**As min (V) (in^2):**	4.89
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

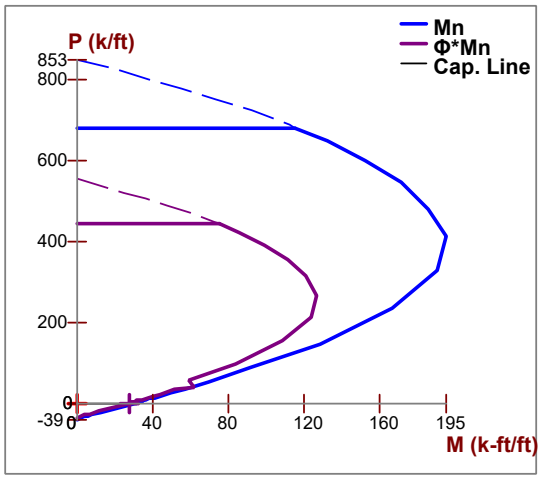
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	28.579
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	429.532		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

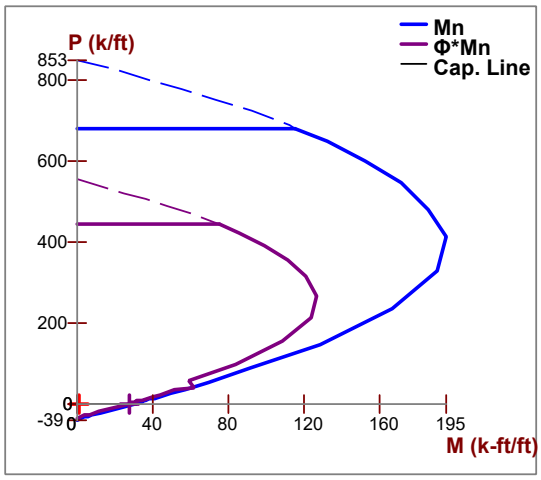
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

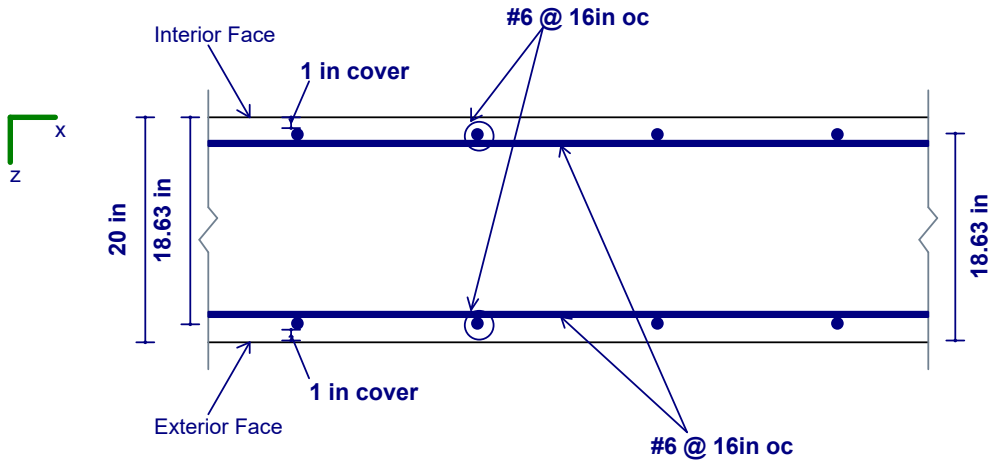
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

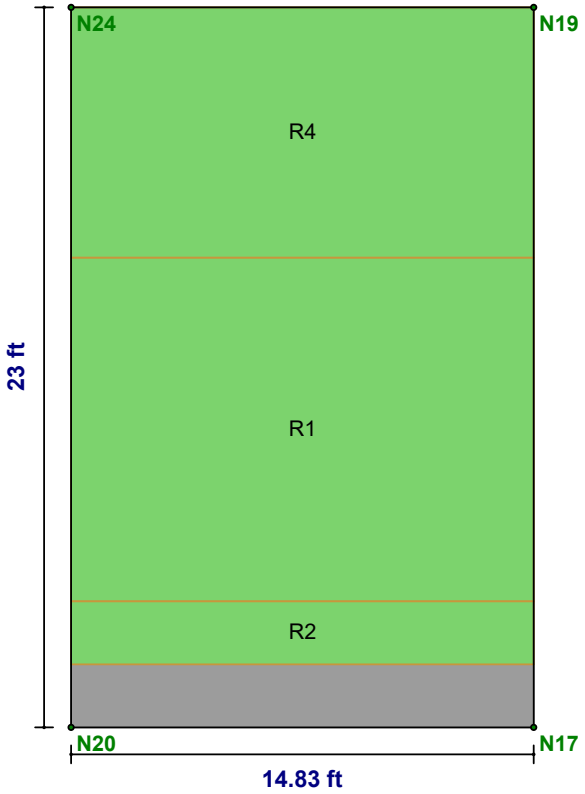


CROSS SECTION DETAILING



Detail Report: WP8

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	23	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.064	2	0.024	1	0.002	2	0.091	2	0.185	5	0.031	1
R2	0.081	2	0.026	1	0	1	0.188	5	0.197	2	0.037	1
R4	0.009	13	0.006	1	0.001	2	0.059	5	0.037	2	0.034	1

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP8 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

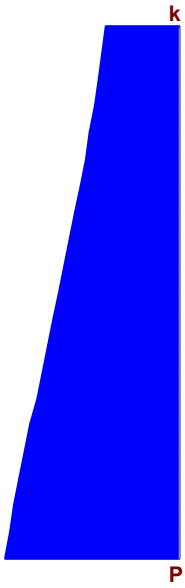
GEOMETRY

Total Height (ft):	11
Total Length (ft):	14.83
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

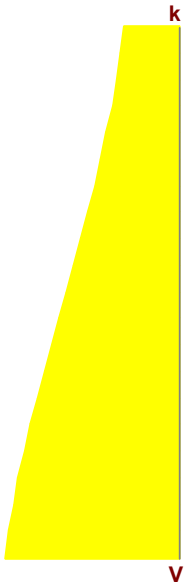
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

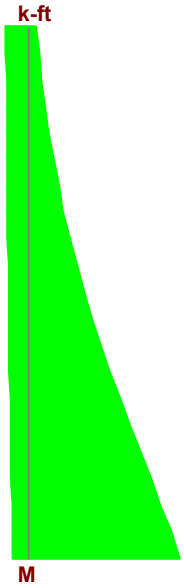
ENVELOPE DIAGRAMS



Min: 68.026 at 11 ft
Max: 162.94 at 0 ft



Min: 7.18 at 11 ft
Max: 22.781 at 0 ft



Min: -239.438 at 0 ft
Max: 33.748 at 11 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.064	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-239.438	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	3760.981		

SHEAR DETAILS

UC Max:	0.024	**phi*Vn (k):**	948.722	**Vs (k):**	589.652
Location (ft):	0	**Vnmax (k):**	1800.829	**Gov LC:**	1
Gov Vu (k):	22.781	**Vc (k):**	675.311		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	5.339
rho Provided (H):	0.003	**As Provided (V) (in^2):**	9.719	**rho min (V):**	0.001
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

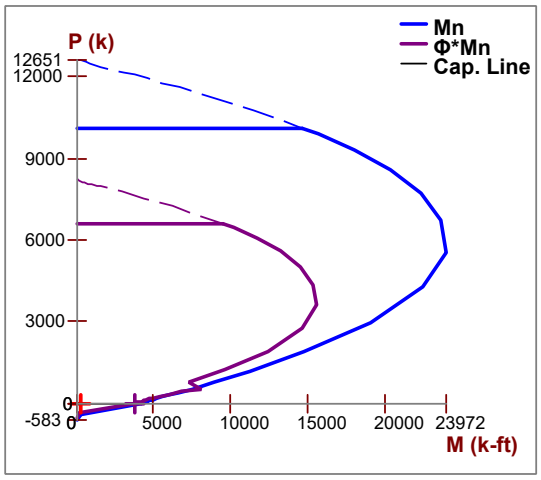
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	14.83	**Icracked (in^4):**	6.575e+6	**KL/r:**	2.569
A (in^2):	3559.2	**Cracked Mom, Mcr (k-ft):**	4172.857		
Igross (in^4):	9.393e+6	**r (in):**	42.981		

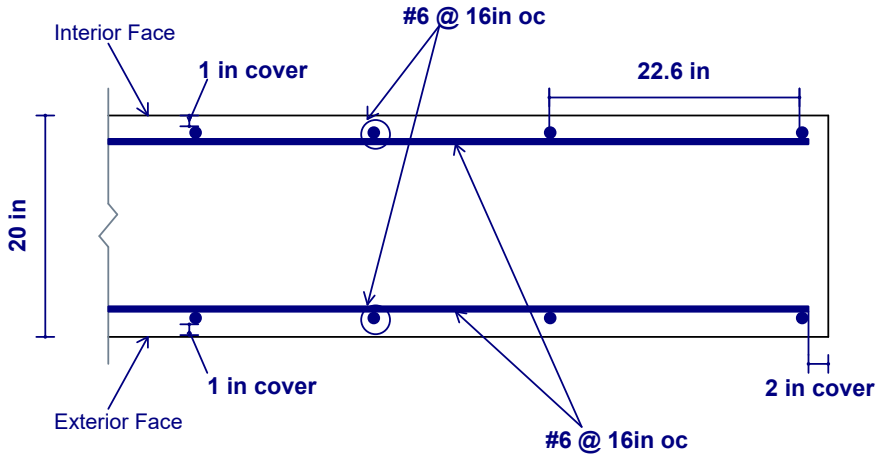
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



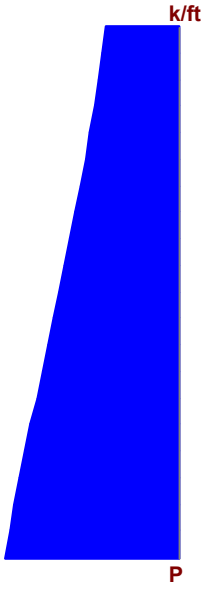
CROSS SECTION DETAILING



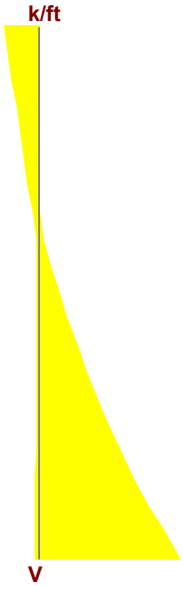
Detail Report: WP8 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

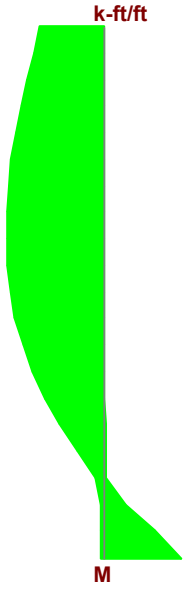
ENVELOPE DIAGRAMS



Min: 4.587 at 11 ft
Max: 10.987 at 0 ft



Min: -1.598 at 0 ft
Max: 0.381 at 11 ft



Min: -2.032 at 0 ft
Max: 2.543 at 7.15 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.073	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	2.543
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	27.827
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.091	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	7.15	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-2.032	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	27.827	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.185	**Gov Vu (k/ft):**	-1.598	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.628	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.031	**Location (ft):**	23
Deflection Ratio:	H/4232	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	9.719	**As min (V) (in^2):**	5.339
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

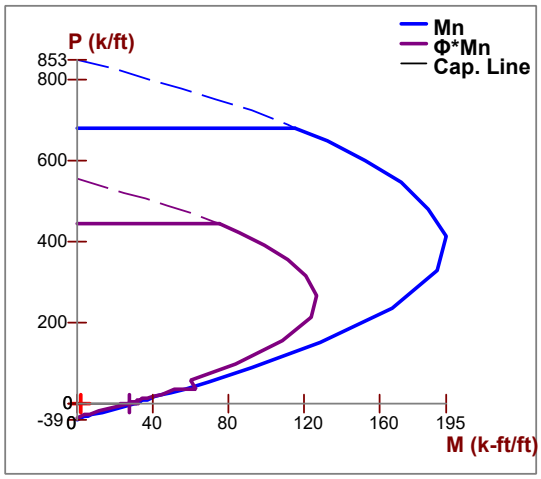
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	468.966		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

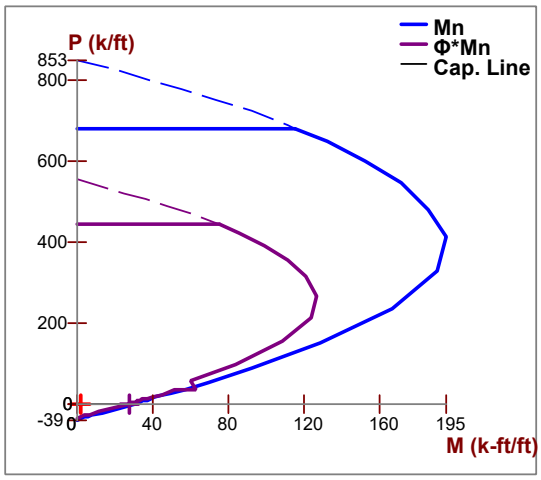
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

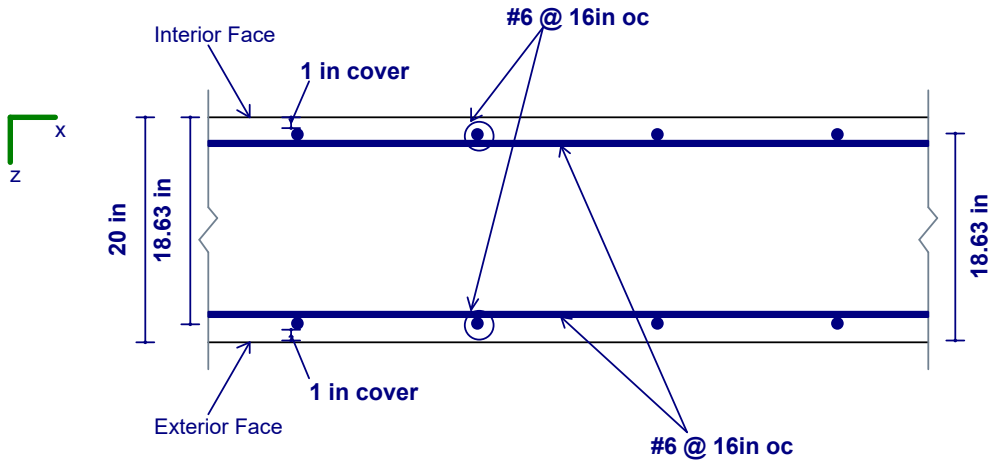
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



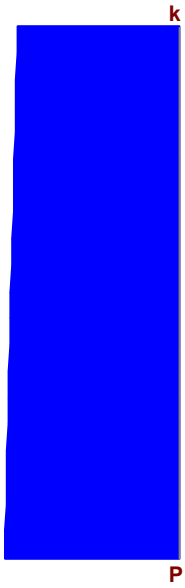
CROSS SECTION DETAILING



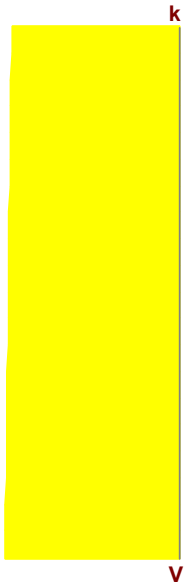
Detail Report: WP8 (In-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

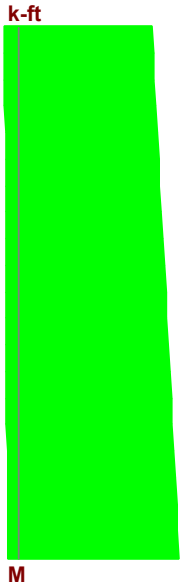
ENVELOPE DIAGRAMS



Min: 169.725 at 2 ft
Max: 182.92 at 0 ft



Min: 24.073 at 2 ft
Max: 25.077 at 0 ft



Min: -304.443 at 0 ft
Max: 23.197 at 2 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.081	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	-304.443	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	3760.981		

SHEAR DETAILS

UC Max:	0.026	**phi*Vn (k):**	948.722	**Vs (k):**	589.652
Location (ft):	0	**Vnmax (k):**	1800.829	**Gov LC:**	1
Gov Vu (k):	25.077	**Vc (k):**	675.311		

DEFLECTION DETAILS

Delta max (in):	0.0003339	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	3.534	**rho min (H):**	0.002	**As min (V) (in^2):**	5.339
rho Provided (H):	0.007	**As Provided (V) (in^2):**	9.719	**rho min (V):**	0.001
As min (H) (in^2):	0.96	**rho Provided (V):**	0.003		

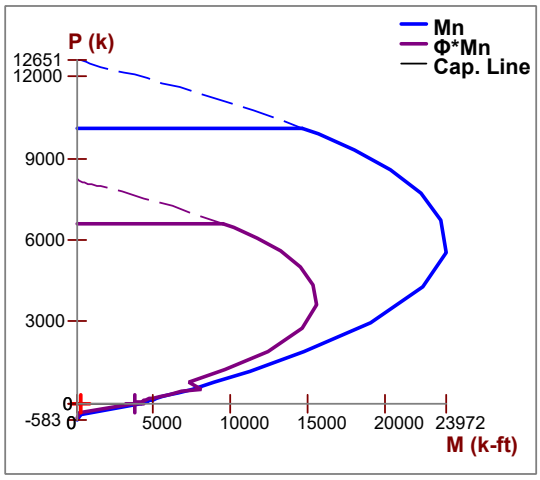
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	14.83	**Icracked (in^4):**	6.575e+6	**KL/r:**	0.467
A (in^2):	3559.2	**Cracked Mom, Mcr (k-ft):**	4172.857		
Igross (in^4):	9.393e+6	**r (in):**	42.981		

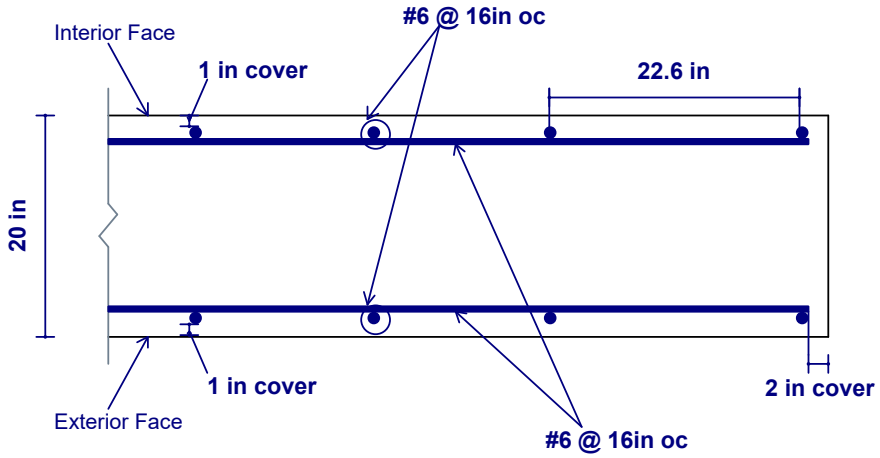
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



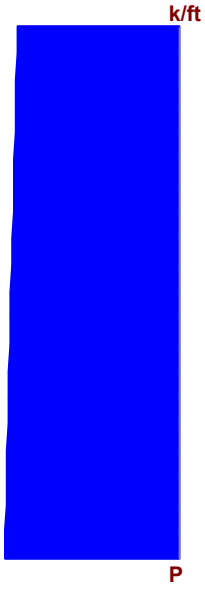
CROSS SECTION DETAILING



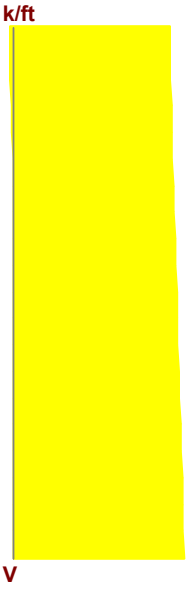
Detail Report: WP8 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

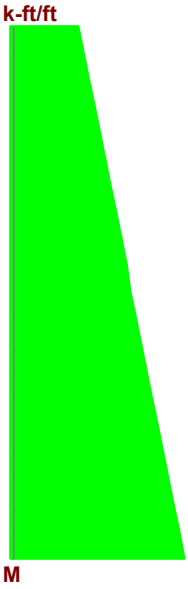
ENVELOPE DIAGRAMS



Min: 11.445 at 2 ft
Max: 12.334 at 0 ft



Min: -1.737 at 0 ft
Max: 0.02 at 2 ft



Min: -5.261 at 0 ft
Max: 0.064 at 2 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.188	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.028	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-5.24	**Gov Pu Ext (+z) (k/ft):**	12.334		
phi*Mn Int (-z) (k-ft/ft):	27.827	**phi*Pn Ext (+z) (k/ft):**	443.609		

SHEAR DETAILS

UC Max:	0.197	**Gov Vu (k/ft):**	-1.722	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.736	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.037	**Location (ft):**	23
Deflection Ratio:	H/657	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	9.719	**As min (V) (in^2):**	5.339
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

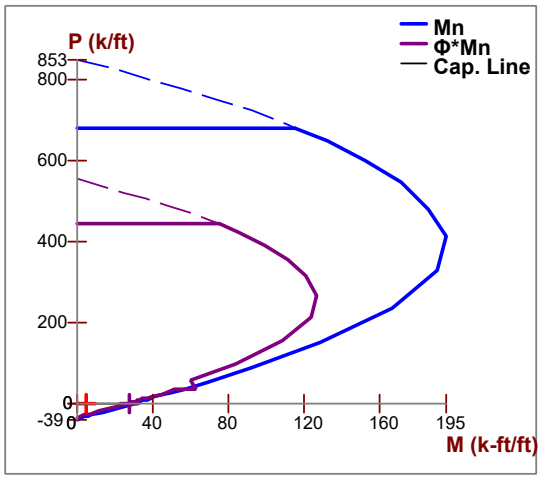
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	4.157
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	468.966		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

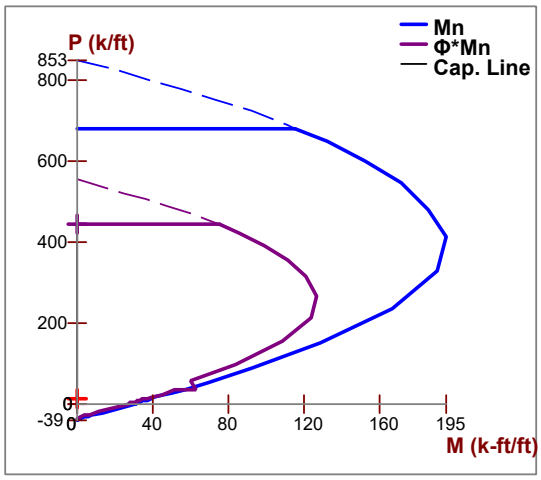
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

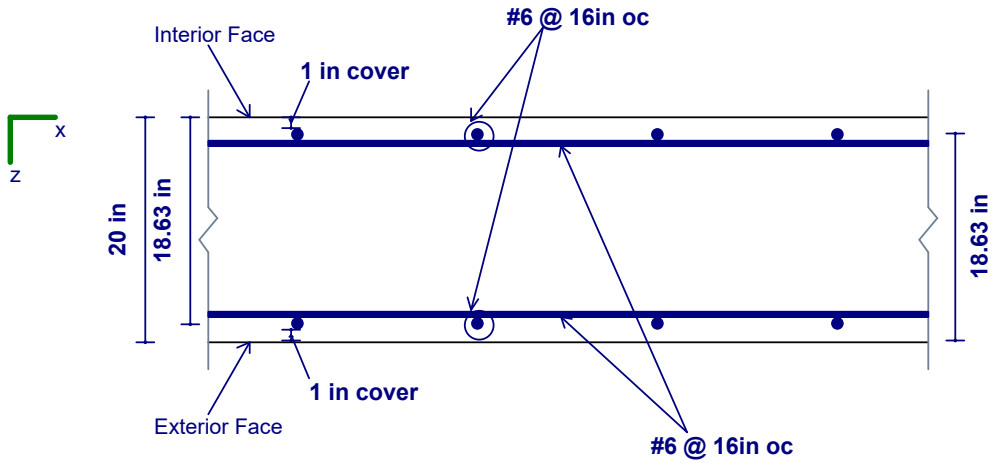
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



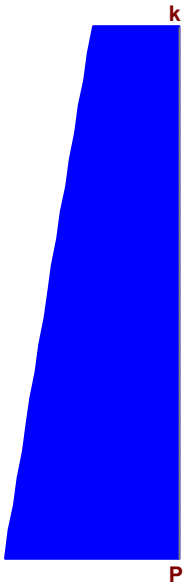
CROSS SECTION DETAILING



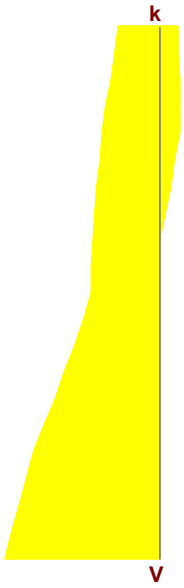
Detail Report: WP8 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

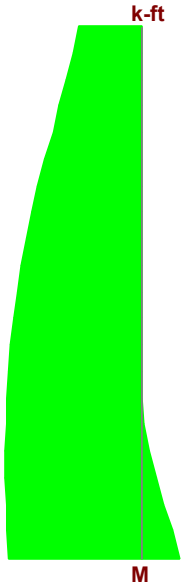
ENVELOPE DIAGRAMS



Min: 33.481 at 8 ft
Max: 67.865 at 0 ft



Min: -0.776 at 6.8 ft
Max: 5.971 at 0 ft



Min: -8.958 at 0 ft
Max: 32.101 at 1.6 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.009	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	1.6	**Gov Mu (k-ft):**	32.101	**Gov LC:**	13
Gov Pu (k):	0	**phi*Mn (k-ft):**	3734.142		

SHEAR DETAILS

UC Max:	0.006	**phi*Vn (k):**	948.722	**Vs (k):**	589.652
Location (ft):	0	**Vnmax (k):**	1800.829	**Gov LC:**	1
Gov Vu (k):	5.971	**Vc (k):**	675.311		

DEFLECTION DETAILS

Delta max (in):	0.001	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.069	**rho min (H):**	0.002	**As min (V) (in^2):**	5.339
rho Provided (H):	0.004	**As Provided (V) (in^2):**	9.719	**rho min (V):**	0.001
As min (H) (in^2):	3.84	**rho Provided (V):**	0.003		

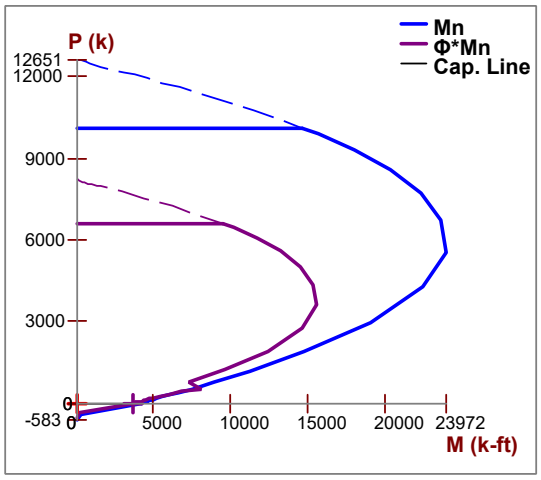
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	14.83	**Icracked (in^4):**	6.575e+6	**KL/r:**	1.869
A (in^2):	3559.2	**Cracked Mom, Mcr (k-ft):**	4172.857		
Igross (in^4):	9.393e+6	**r (in):**	42.981		

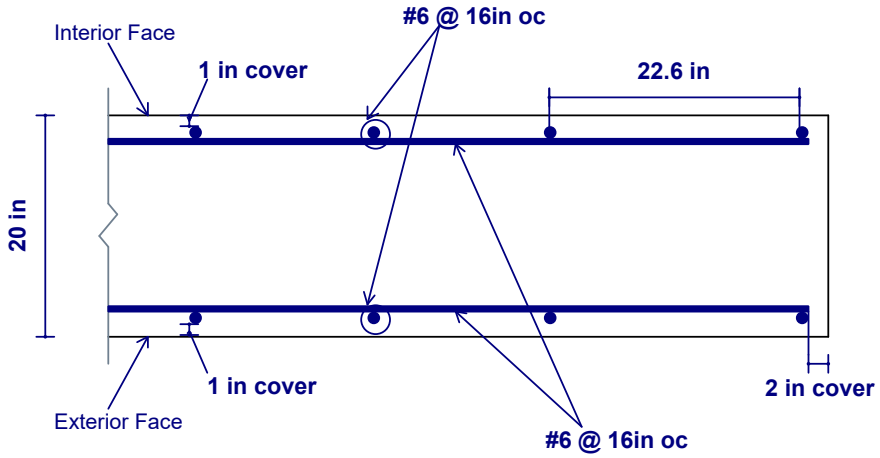
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



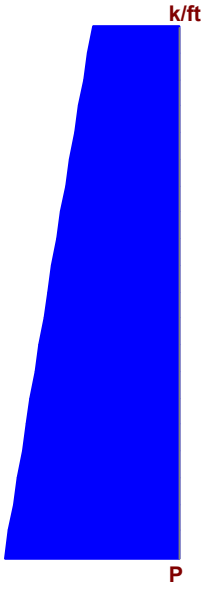
CROSS SECTION DETAILING



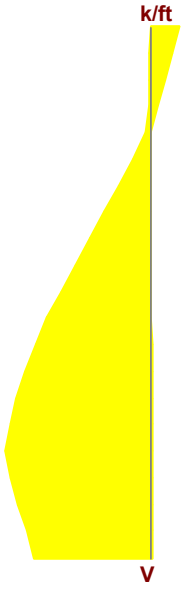
Detail Report: WP8 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	14.83	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

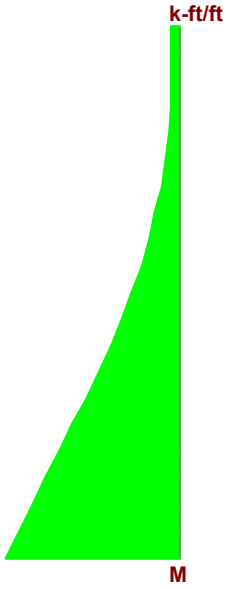
ENVELOPE DIAGRAMS



Min: 2.258 at 8 ft
Max: 4.576 at 0 ft



Min: -0.062 at 8 ft
Max: 0.3 at 1.6 ft



Min: -0.005 at 0 ft
Max: 1.637 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	1.637
Location (ft):	0	**Gov LC Int (-z):**	13	**phi*Mn Ext (+z) (k-ft/ft):**	27.827
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.059	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	5
Gov Mu Int (-z) (k-ft/ft):	-0.005	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	27.827	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.037	**Gov Vu (k/ft):**	0.3	**phi*Vns (k/ft):**	0
Location (ft):	1.6	**phi*Vnc (k/ft):**	8.134	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.034	**Location (ft):**	1.15
Deflection Ratio:	H/2844	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	9.719	**As min (V) (in^2):**	5.339
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

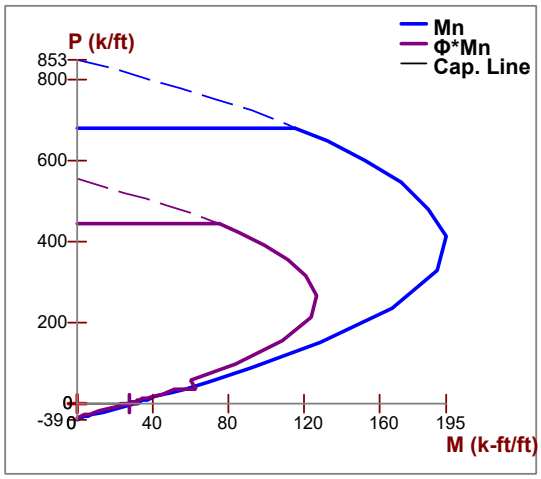
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	16.628
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	468.966		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

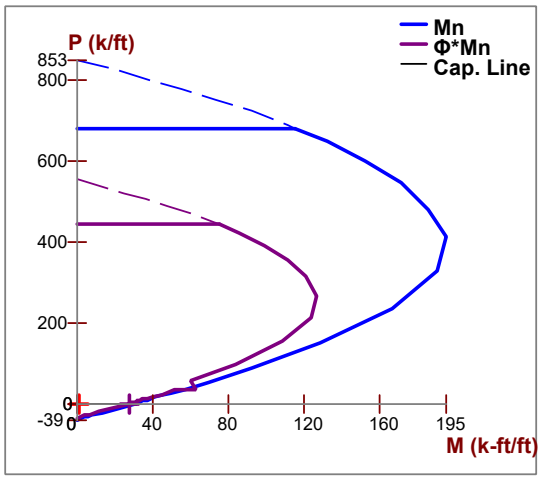
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

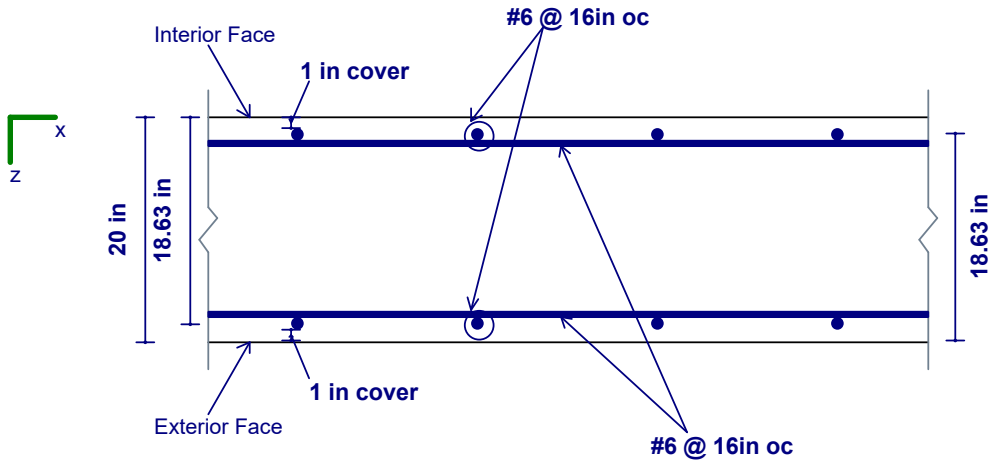
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

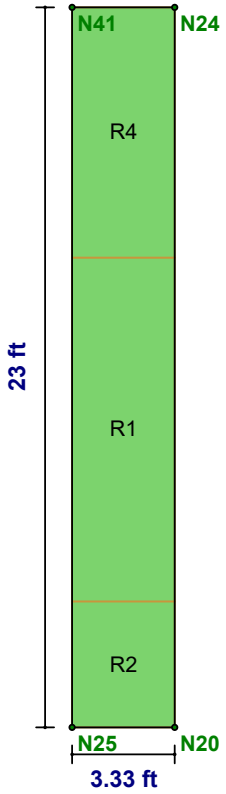


CROSS SECTION DETAILING



Detail Report: WP9

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	23	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.111	5	0.107	2	0.002	1	0.037	1	0.034	1	0.001	2
R1	0.115	2	0.131	2	0.011	1	0.024	1	0.019	1	0.001	2
R4	0.019	1	0.037	2	0.008	1	0.021	2	0.052	2	0.001	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP9 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

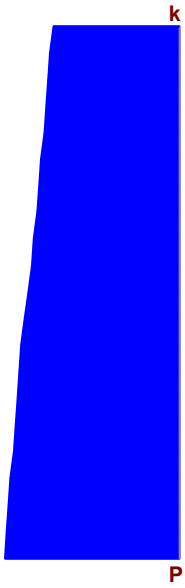
GEOMETRY

Total Height (ft):	4
Total Length (ft):	3.334
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

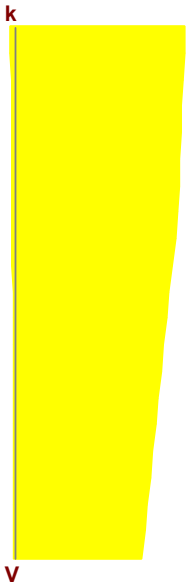
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

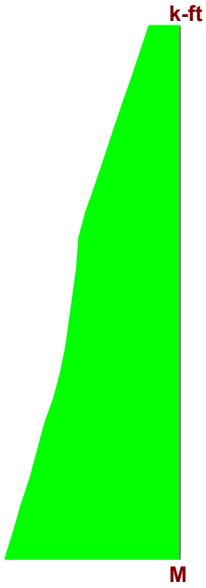
ENVELOPE DIAGRAMS



Min: 39.858 at 4 ft
Max: 55.242 at 0 ft



Min: -22.775 at 4 ft
Max: 0.398 at 4 ft



Min: -0.109 at 4 ft
Max: 35.724 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.111	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	1	**Gov Mu (k-ft):**	25.621	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	230.116		

SHEAR DETAILS

UC Max:	0.107	**phi*Vn (k):**	213.287	**Vs (k):**	132.562
Location (ft):	4	**Vnmax (k):**	404.852	**Gov LC:**	2
Gov Vu (k):	-22.775	**Vc (k):**	151.82		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	4.418	**rho min (H):**	0.002	**As min (V) (in^2):**	1.2
rho Provided (H):	0.005	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.001
As min (H) (in^2):	1.92	**rho Provided (V):**	0.003		

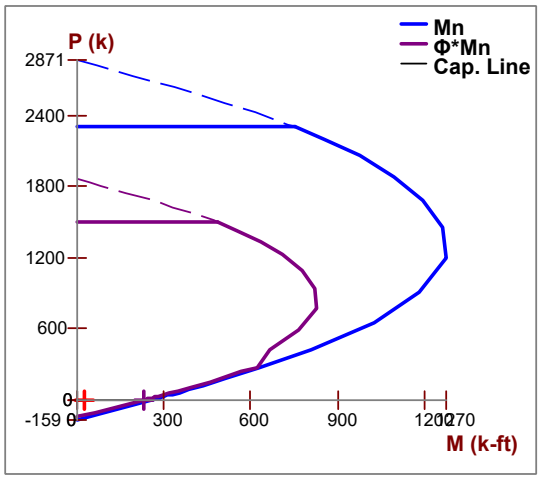
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	3.334	**Icracked (in^4):**	74711.476	**KL/r:**	4.156
A (in^2):	800.16	**Cracked Mom, Mcr (k-ft):**	210.903		
Igross (in^4):	1.067e+5	**r (in):**	9.663		

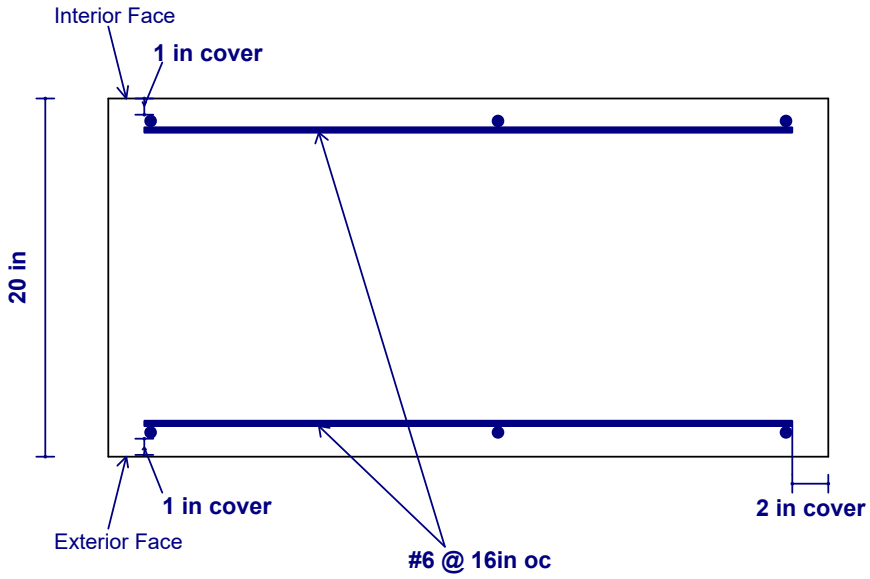
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



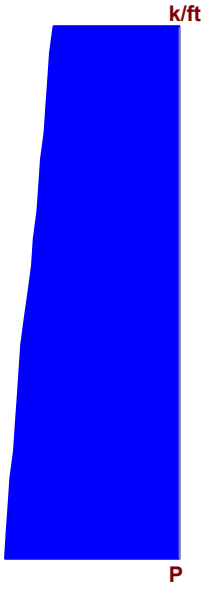
CROSS SECTION DETAILING



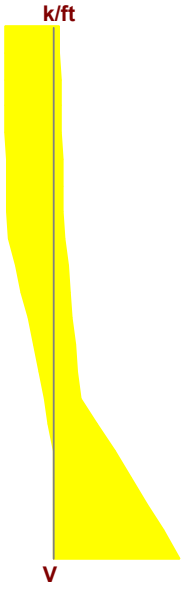
Detail Report: WP9 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	4	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

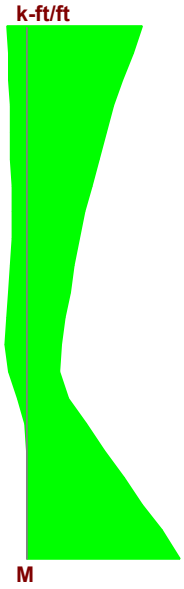
ENVELOPE DIAGRAMS



Min: 11.955 at 4 ft
Max: 16.569 at 0 ft



Min: -0.356 at 0 ft
Max: 0.131 at 4 ft



Min: -0.309 at 0 ft
Max: 0.039 at 1.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.037	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	16.569	**UC Max Ext (+z):**	0.037	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	447.72	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-0.309	**Gov Pu Ext (+z) (k/ft):**	16.569		
phi*Mn Int (-z) (k-ft/ft):	8.345	**phi*Pn Ext (+z) (k/ft):**	447.72		

SHEAR DETAILS

UC Max:	0.034	**Gov Vu (k/ft):**	-0.356	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	10.518	**Gov LC:**	1

DEFLECTION DETAILS

Delta max (in):	0.001	**Location (ft):**	18.4
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.2
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

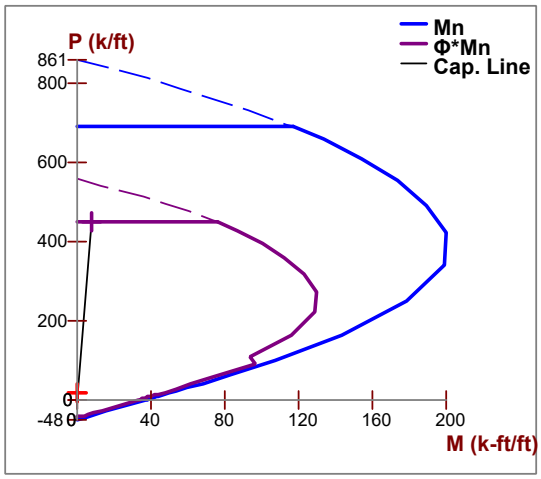
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	8.314
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	105.43		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

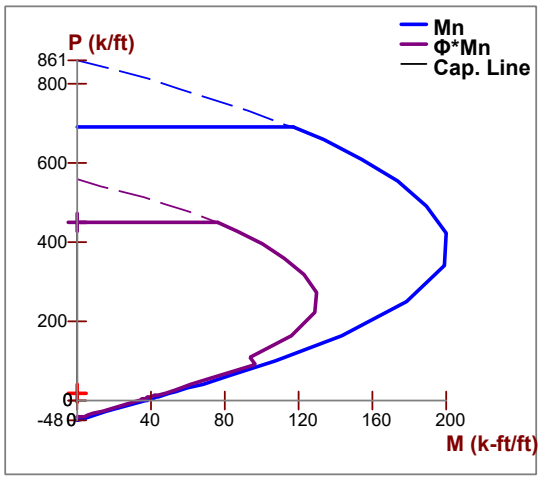
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

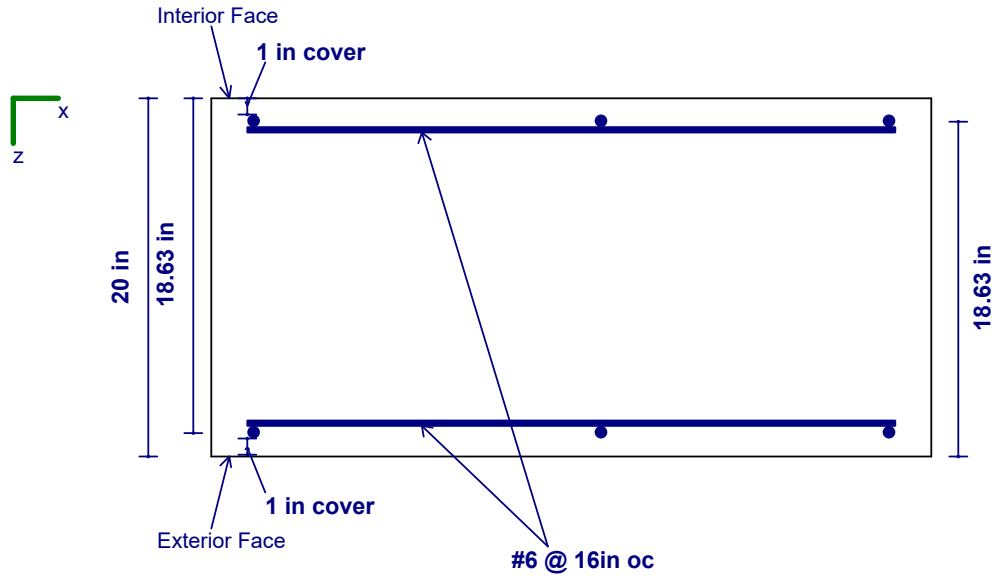
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



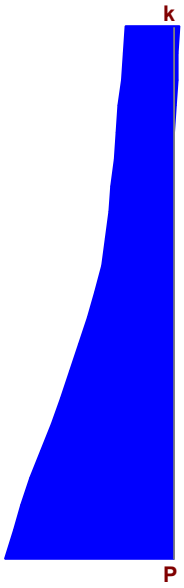
CROSS SECTION DETAILING



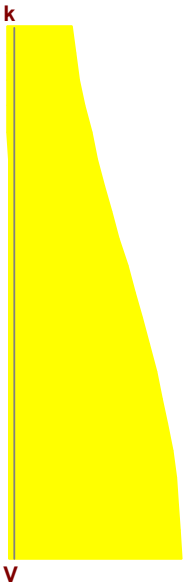
Detail Report: WP9 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

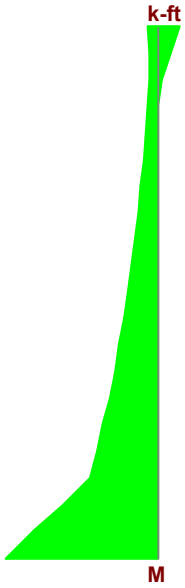
ENVELOPE DIAGRAMS



Min: -1.174 at 11 ft
Max: 35.598 at 0 ft



Min: -22.997 at 0 ft
Max: 0.738 at 11 ft



Min: -3.925 at 11 ft
Max: 26.972 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.115	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	26.392	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	230.116		

SHEAR DETAILS

UC Max:	0.131	**phi*Vn (k):**	175.332	**Vs (k):**	132.562
Location (ft):	0	**Vnmax (k):**	404.852	**Gov LC:**	2
Gov Vu (k):	-22.997	**Vc (k):**	101.213		

DEFLECTION DETAILS

Delta max (in):	0.011	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	1.2
rho Provided (H):	0.003	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.001
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

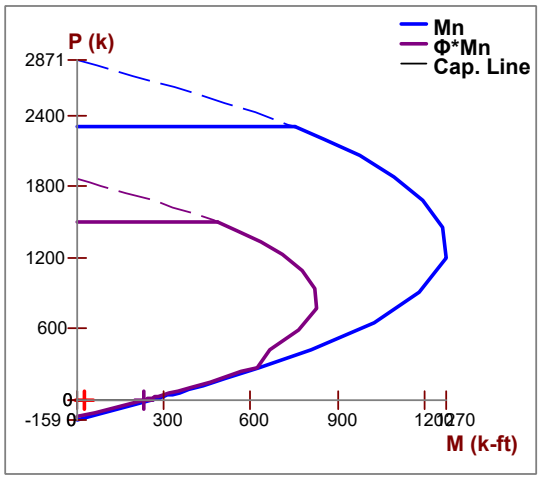
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	3.334	**Icracked (in^4):**	74711.476	**KL/r:**	11.429
A (in^2):	800.16	**Cracked Mom, Mcr (k-ft):**	210.903		
Igross (in^4):	1.067e+5	**r (in):**	9.663		

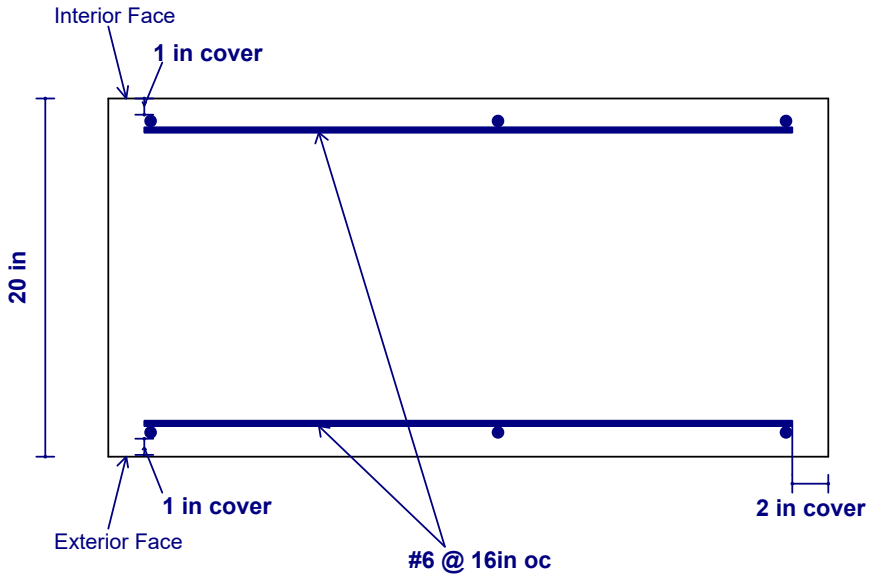
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



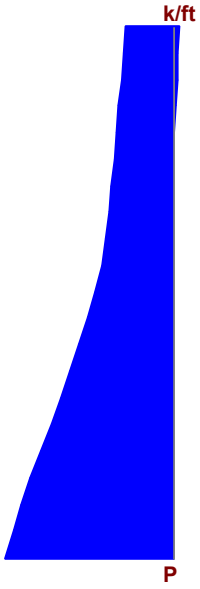
CROSS SECTION DETAILING



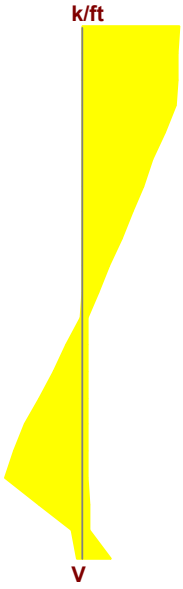
Detail Report: WP9 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

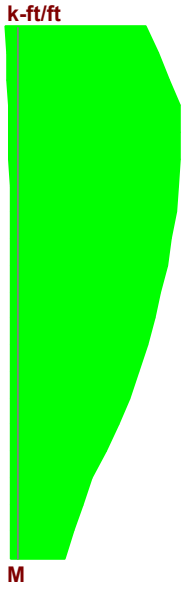
ENVELOPE DIAGRAMS



Min: -0.352 at 11 ft
Max: 10.677 at 0 ft



Min: -0.167 at 11 ft
Max: 0.13 at 1.65 ft



Min: -0.642 at 8.25 ft
Max: 0.04 at 11 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.024	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	10.677	**UC Max Ext (+z):**	0.024	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	447.72	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	10.677		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	447.72		

SHEAR DETAILS

UC Max:	0.019	**Gov Vu (k/ft):**	-0.167	**phi*Vns (k/ft):**	0
Location (ft):	11	**phi*Vnc (k/ft):**	8.814	**Gov LC:**	1

DEFLECTION DETAILS

Delta max (in):	0.000973	**Location (ft):**	18.4
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.2
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

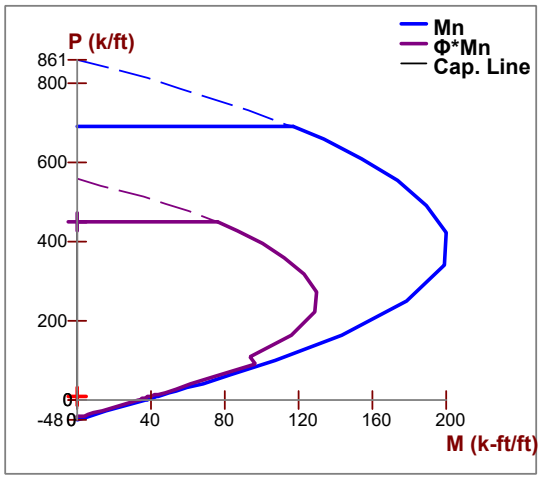
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	105.43		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

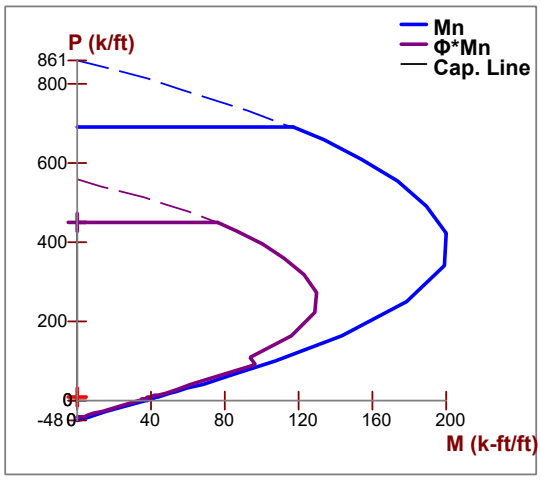
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

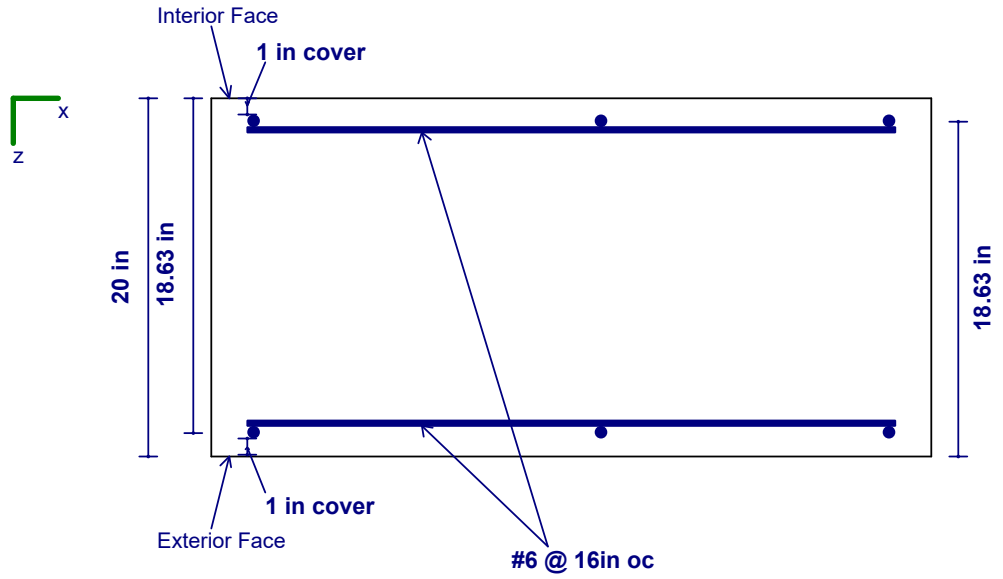
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



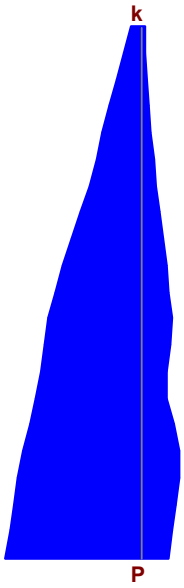
CROSS SECTION DETAILING



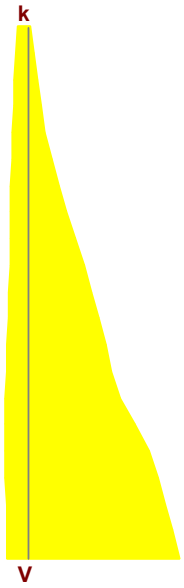
Detail Report: WP9 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

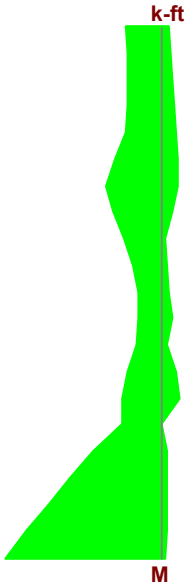
ENVELOPE DIAGRAMS



Min: -2.845 at 1.6 ft
Max: 9.933 at 0 ft



Min: -6.552 at 0 ft
Max: 0.93 at 1.6 ft



Min: -0.486 at 2.4 ft
Max: 4.345 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.019	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	4.345	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	230.116		

SHEAR DETAILS

UC Max:	0.037	**phi*Vn (k):**	175.332	**Vs (k):**	132.562
Location (ft):	0	**Vnmax (k):**	404.852	**Gov LC:**	2
Gov Vu (k):	-6.552	**Vc (k):**	101.213		

DEFLECTION DETAILS

Delta max (in):	0.008	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.069	**rho min (H):**	0.002	**As min (V) (in^2):**	1.2
rho Provided (H):	0.004	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.001
As min (H) (in^2):	3.84	**rho Provided (V):**	0.003		

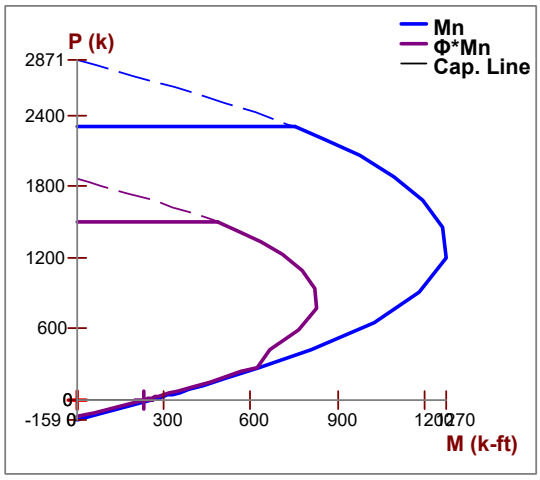
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	3.334	**Icracked (in^4):**	74711.476	**KL/r:**	8.312
A (in^2):	800.16	**Cracked Mom, Mcr (k-ft):**	210.903		
Igross (in^4):	1.067e+5	**r (in):**	9.663		

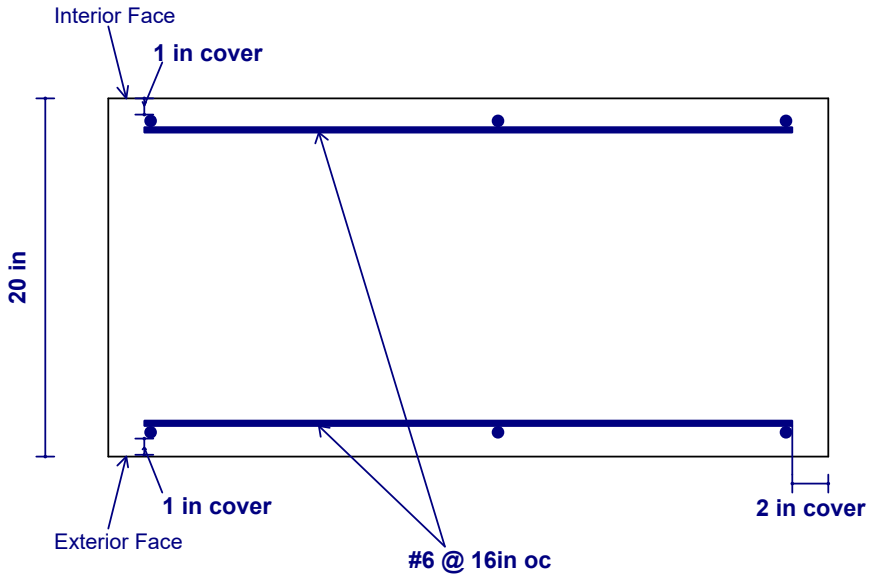
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



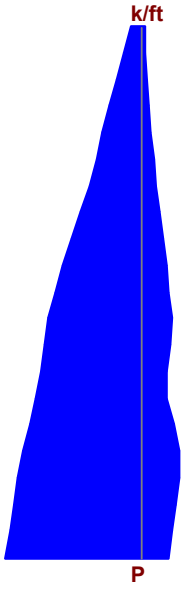
CROSS SECTION DETAILING



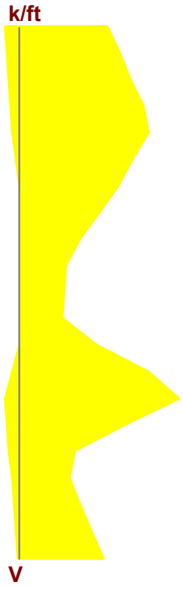
Detail Report: WP9 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	3.334	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

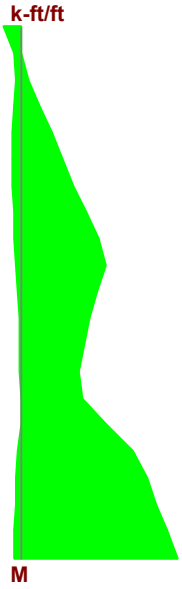
ENVELOPE DIAGRAMS



Min: -0.853 at 1.6 ft
Max: 2.979 at 0 ft



Min: -0.446 at 2.4 ft
Max: 0.036 at 2.4 ft



Min: -0.713 at 0 ft
Max: 0.074 at 8 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.021	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.074
Location (ft):	0	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z) (k-ft/ft):**	33.364
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.002	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	8	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.713	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	33.364	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.052	**Gov Vu (k/ft):**	-0.446	**phi*Vns (k/ft):**	0
Location (ft):	2.4	**phi*Vnc (k/ft):**	8.526	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.001	**Location (ft):**	1.15
Deflection Ratio:	H/10000	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.2
rho Provided (V):	0.003	**rho min (V):**	0.001

WALL SEGMENT SECTION PROPERTIES

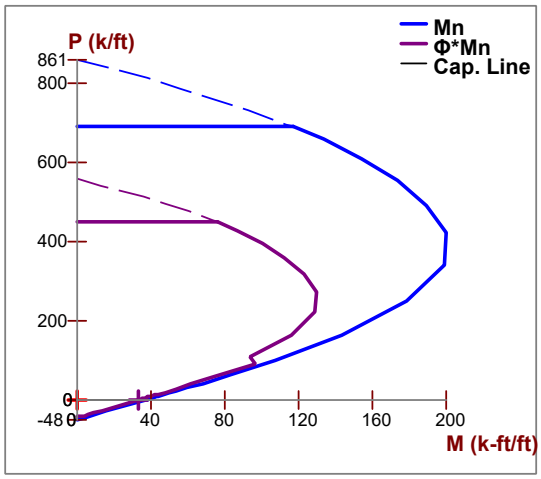
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	16.628
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	105.43		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

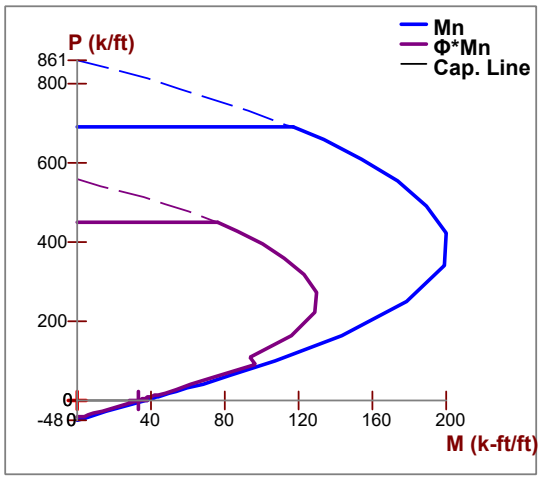
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

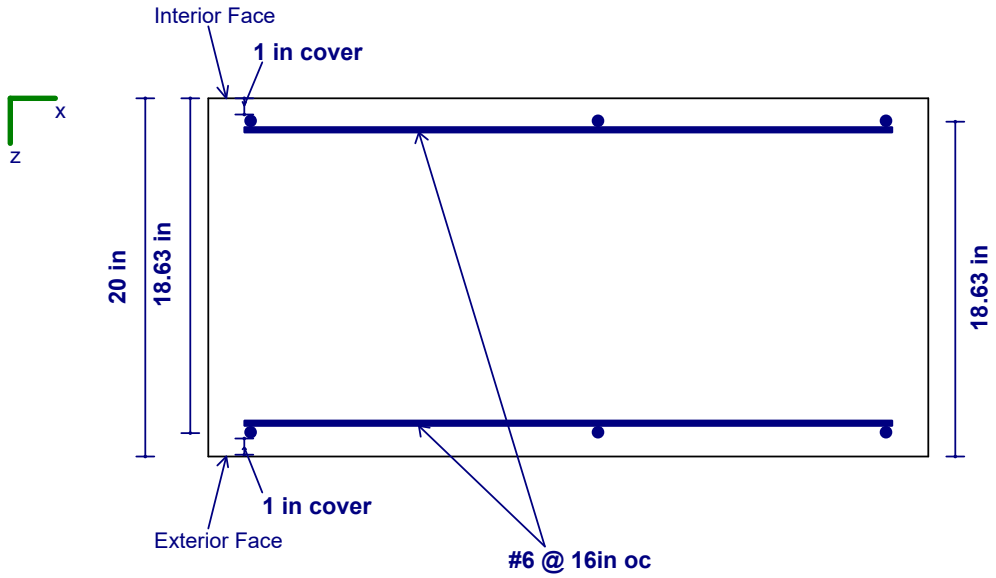
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

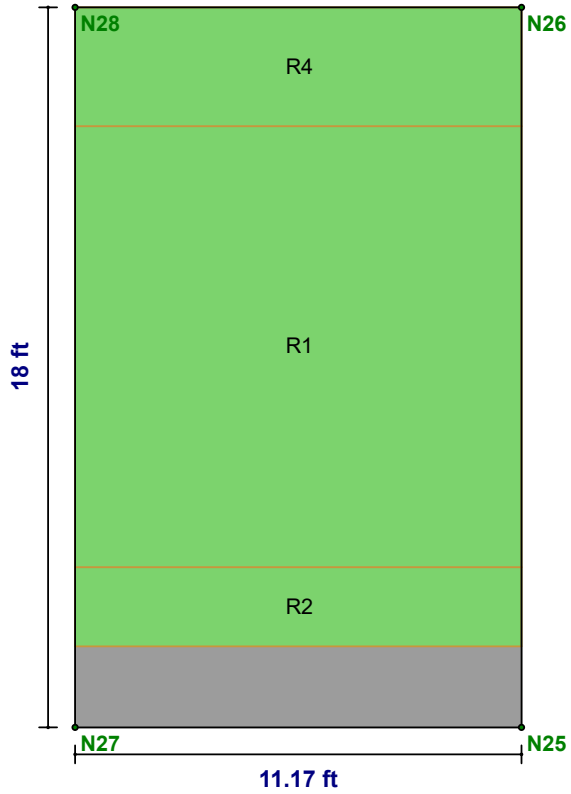


CROSS SECTION DETAILING



Detail Report: WP10

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	18	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.013	1	0.011	5	0	1	0.071	5	0.093	2	0.02	1
R1	0.012	1	0.013	5	0.001	1	0.027	5	0.082	5	0.017	1
R4	0.005	13	0.008	2	0	1	0.002	5	0.006	5	0.018	1

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP10 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

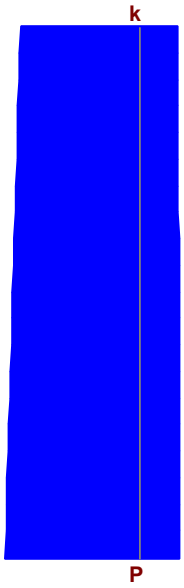
GEOMETRY

Total Height (ft):	2
Total Length (ft):	11.17
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

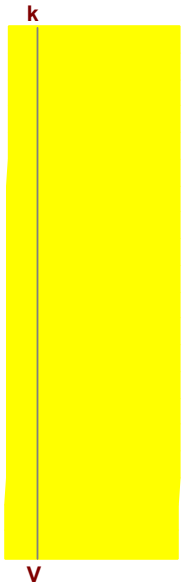
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

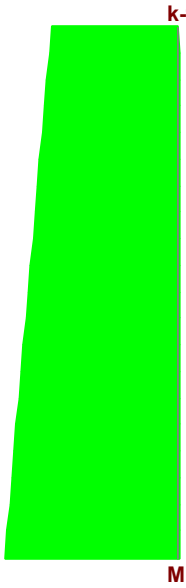
ENVELOPE DIAGRAMS



Min: -19.518 at 0 ft
Max: 65.276 at 0 ft



Min: -7.771 at 2 ft
Max: 1.642 at 0 ft



Min: -0.314 at 0 ft
Max: 30.609 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.013	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	30.609	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	2292.302		

SHEAR DETAILS

UC Max:	0.011	**phi*Vn (k):**	714.58	**Vs (k):**	444.128
Location (ft):	2	**Vnmax (k):**	1356.389	**Gov LC:**	5
Gov Vu (k):	-7.771	**Vc (k):**	508.646		

DEFLECTION DETAILS

Delta max (in):	8.16e-5	**Location (ft):**	18
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	3.534	**rho min (H):**	0.002	**As min (V) (in^2):**	4.021
rho Provided (H):	0.007	**As Provided (V) (in^2):**	7.952	**rho min (V):**	0.002
As min (H) (in^2):	0.96	**rho Provided (V):**	0.003		

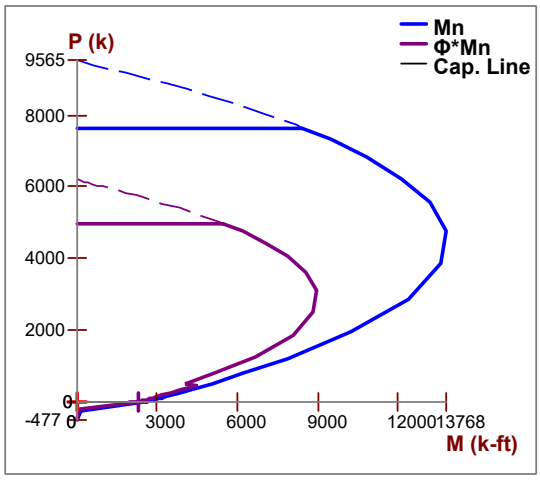
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	11.17	**Icracked (in^4):**	2.81e+6	**KL/r:**	0.62
A (in^2):	2680.8	**Cracked Mom, Mcr (k-ft):**	2367.323		
Igross (in^4):	4.014e+6	**r (in):**	32.374		

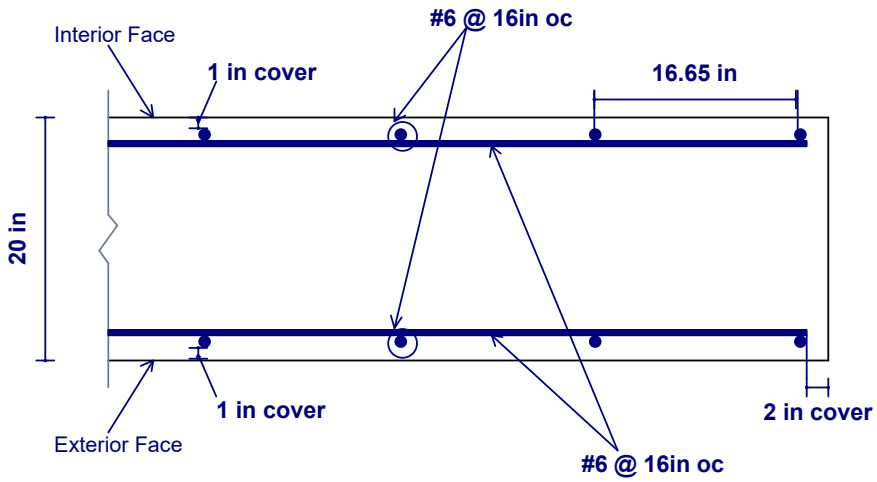
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



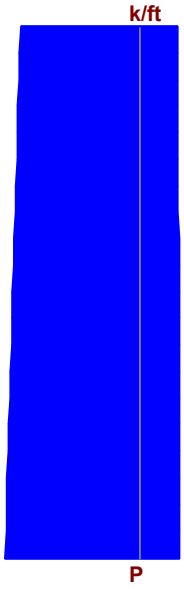
CROSS SECTION DETAILING



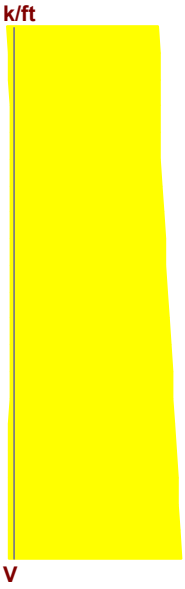
Detail Report: WP10 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	2	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

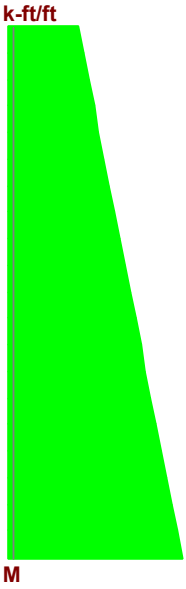
ENVELOPE DIAGRAMS



Min: -1.747 at 0 ft
Max: 5.844 at 0 ft



Min: -0.747 at 0 ft
Max: 0.024 at 2 ft



Min: -2.145 at 0 ft
Max: 0.057 at 2 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.071	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.057
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	30.072
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.002	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	2	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-2.145	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	30.072	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.093	**Gov Vu (k/ft):**	-0.747	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.076	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.02	**Location (ft):**	18
Deflection Ratio:	H/1202	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.952	**As min (V) (in^2):**	4.021
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

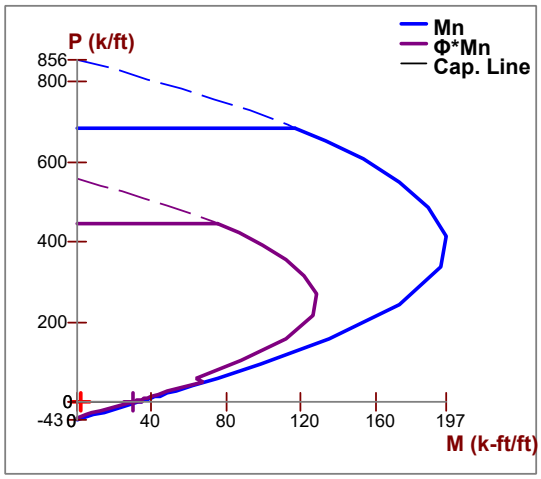
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	4.157
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	353.226		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

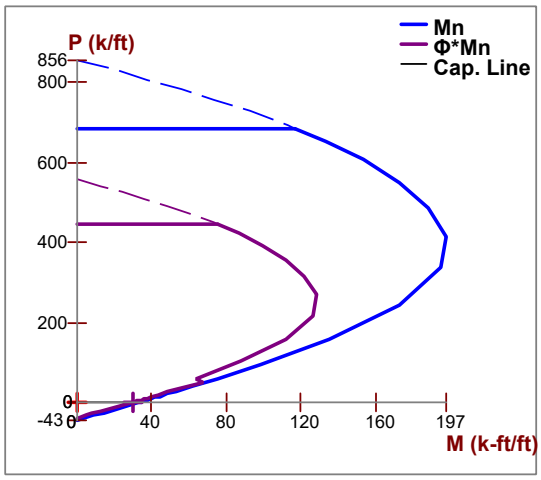
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

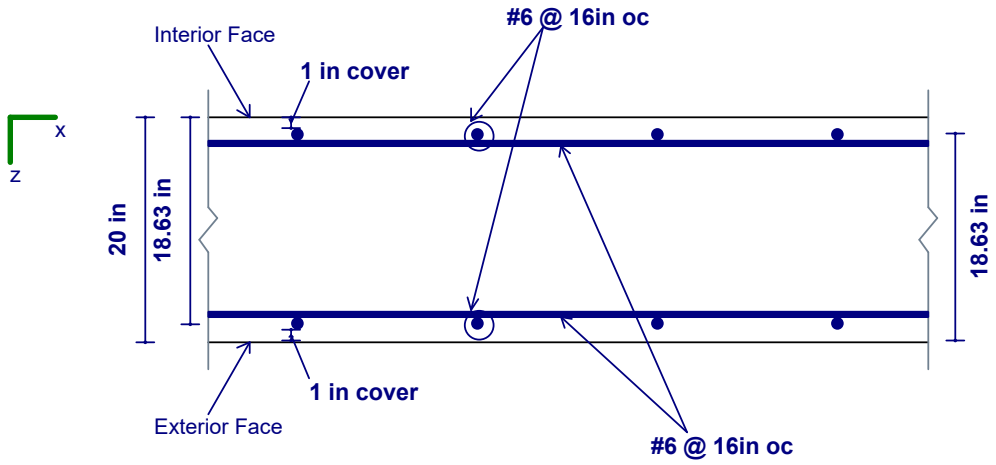
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



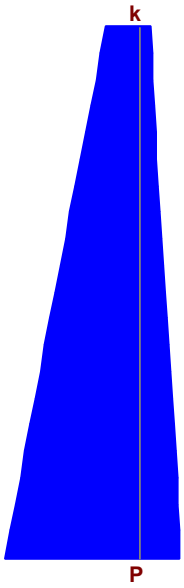
CROSS SECTION DETAILING



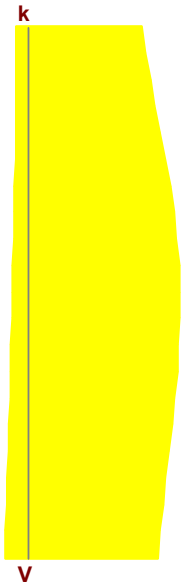
Detail Report: WP10 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

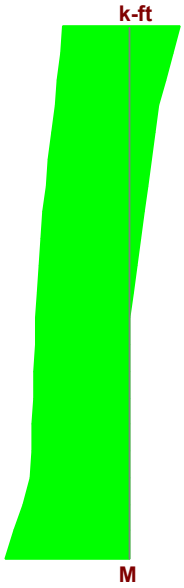
ENVELOPE DIAGRAMS



Min: -17.602 at 0 ft
Max: 57.631 at 0 ft



Min: -9.394 at 4.95 ft
Max: 1.33 at 0 ft



Min: -11.615 at 11 ft
Max: 27.554 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.012	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	27.554	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	2292.302		

SHEAR DETAILS

UC Max:	0.013	**phi*Vn (k):**	714.58	**Vs (k):**	444.128
Location (ft):	4.95	**Vnmax (k):**	1356.389	**Gov LC:**	5
Gov Vu (k):	-9.394	**Vc (k):**	508.646		

DEFLECTION DETAILS

Delta max (in):	0.0007767	**Location (ft):**	18
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	4.021
rho Provided (H):	0.003	**As Provided (V) (in^2):**	7.952	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

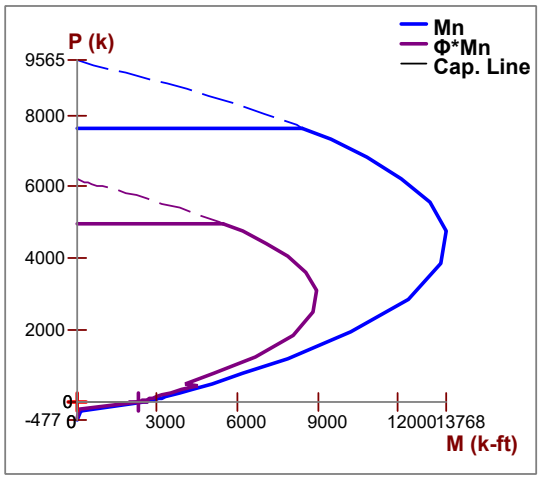
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	11.17	**Icracked (in^4):**	2.81e+6	**KL/r:**	3.411
A (in^2):	2680.8	**Cracked Mom, Mcr (k-ft):**	2367.323		
Igross (in^4):	4.014e+6	**r (in):**	32.374		

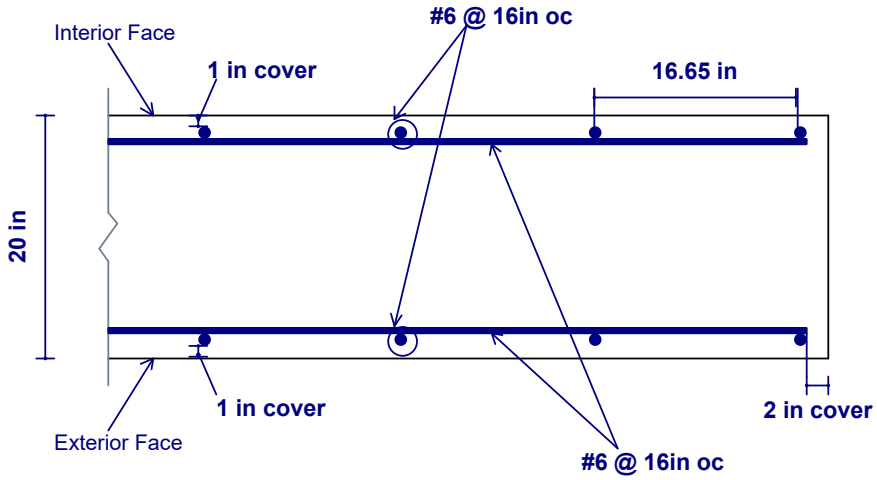
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



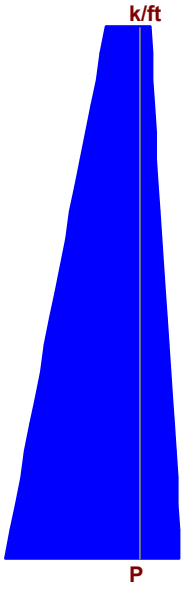
CROSS SECTION DETAILING



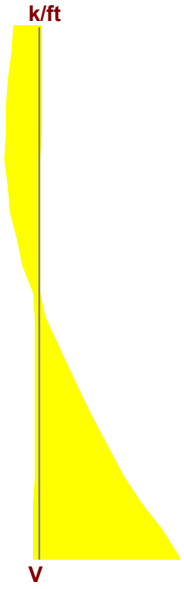
Detail Report: WP10 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

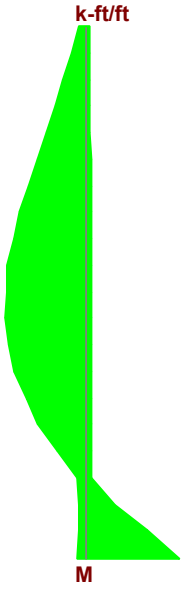
ENVELOPE DIAGRAMS



Min: -1.576 at 0 ft
Max: 5.159 at 0 ft



Min: -0.661 at 0 ft
Max: 0.148 at 8.25 ft



Min: -0.825 at 0 ft
Max: 0.709 at 4.95 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.027	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.709
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	30.072
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.024	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	4.95	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.825	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	30.072	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.082	**Gov Vu (k/ft):**	-0.661	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.096	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.017	**Location (ft):**	18
Deflection Ratio:	H/7632	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.952	**As min (V) (in^2):**	4.021
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

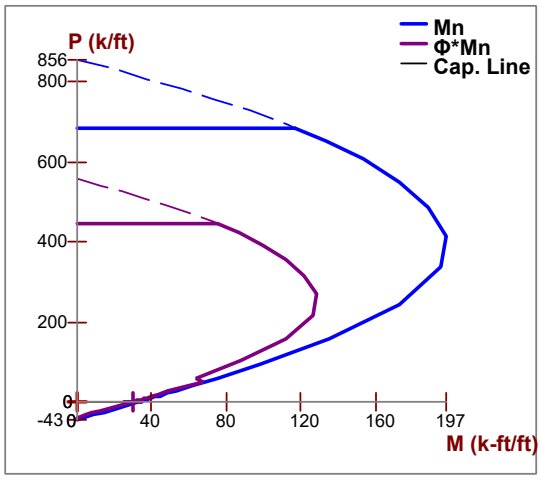
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	353.226		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

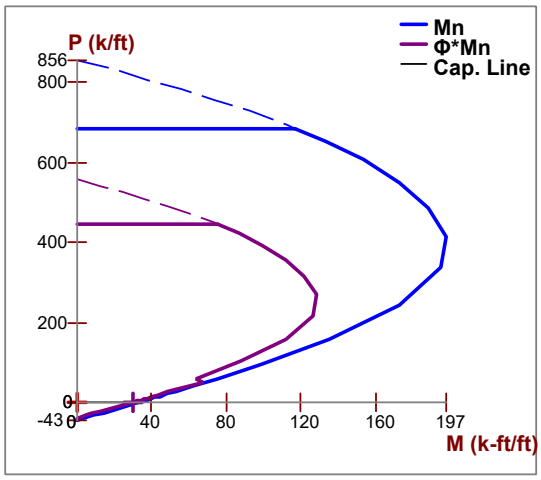
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

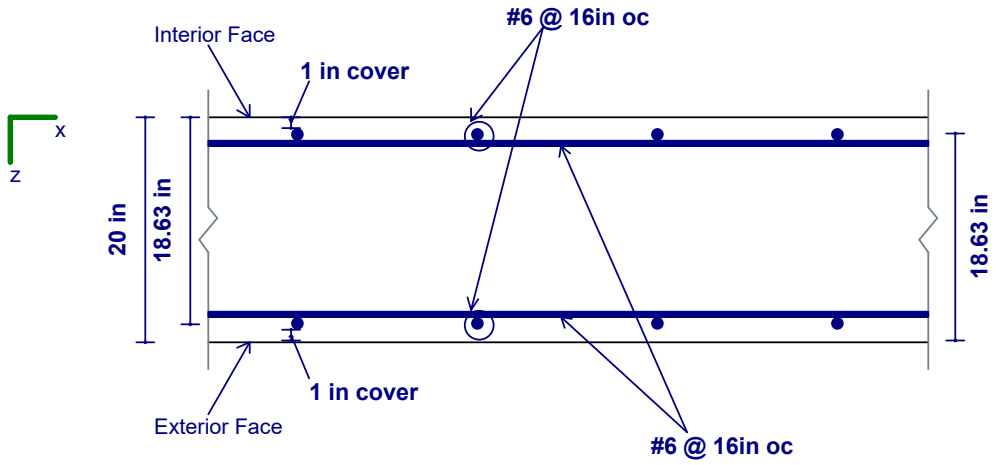
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



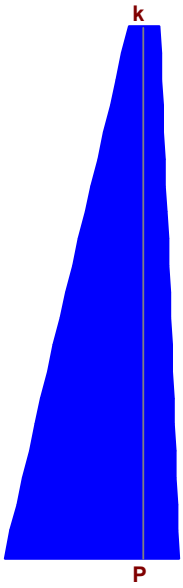
CROSS SECTION DETAILING



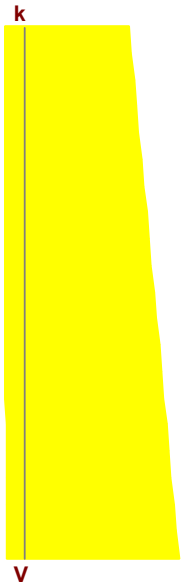
Detail Report: WP10 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	3	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

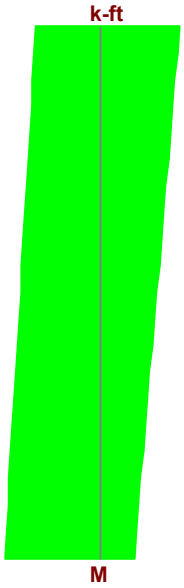
ENVELOPE DIAGRAMS



Min: -3.424 at 0 ft
Max: 13.371 at 0 ft



Min: -6.056 at 0 ft
Max: 0.73 at 3 ft



Min: -9.239 at 3 ft
Max: 10.968 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.005	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	10.968	**Gov LC:**	13
Gov Pu (k):	0	**phi*Mn (k-ft):**	2292.302		

SHEAR DETAILS

UC Max:	0.008	**phi*Vn (k):**	714.58	**Vs (k):**	444.128
Location (ft):	0	**Vnmax (k):**	1356.389	**Gov LC:**	2
Gov Vu (k):	-6.056	**Vc (k):**	508.646		

DEFLECTION DETAILS

Delta max (in):	0.0002886	**Location (ft):**	18
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	2.651	**rho min (H):**	0.002	**As min (V) (in^2):**	4.021
rho Provided (H):	0.004	**As Provided (V) (in^2):**	7.952	**rho min (V):**	0.002
As min (H) (in^2):	1.44	**rho Provided (V):**	0.003		

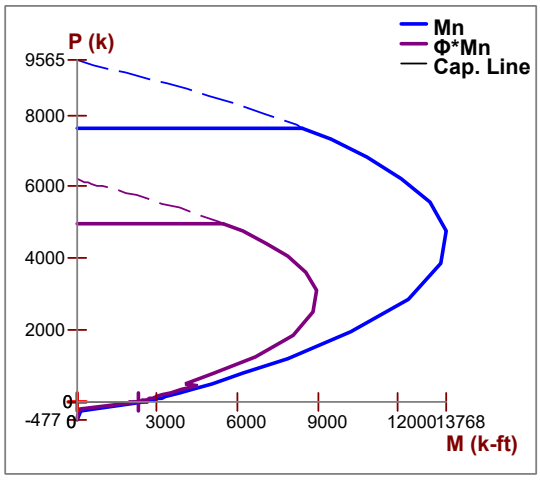
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	11.17	**Icracked (in^4):**	2.81e+6	**KL/r:**	0.93
A (in^2):	2680.8	**Cracked Mom, Mcr (k-ft):**	2367.323		
Igross (in^4):	4.014e+6	**r (in):**	32.374		

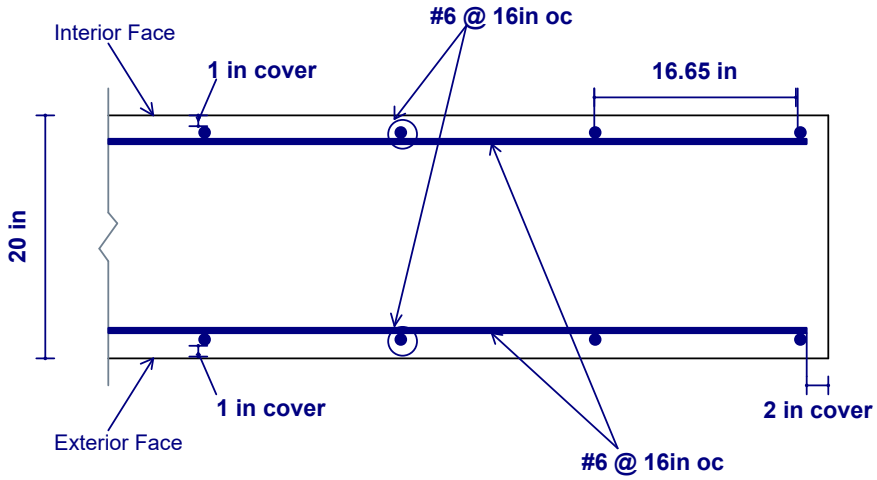
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



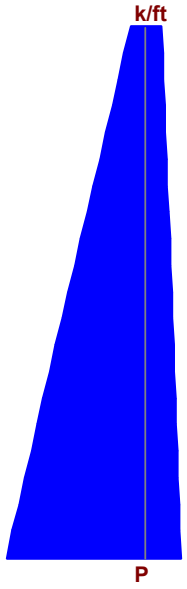
CROSS SECTION DETAILING



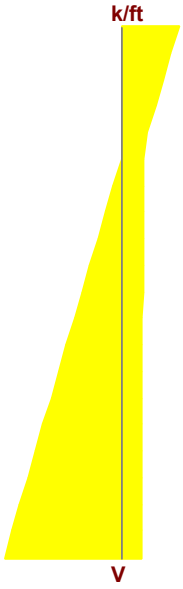
Detail Report: WP10 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	3	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	11.17	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

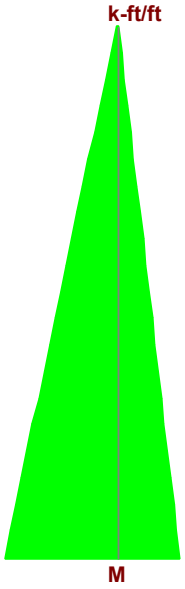
ENVELOPE DIAGRAMS



Min: -0.307 at 0 ft
Max: 1.197 at 0 ft



Min: -0.025 at 3 ft
Max: 0.051 at 0 ft



Min: -0.027 at 0 ft
Max: 0.05 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.001	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.05
Location (ft):	0	**Gov LC Int (-z):**	13	**phi*Mn Ext (+z) (k-ft/ft):**	30.072
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.002	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	5
Gov Mu Int (-z) (k-ft/ft):	-0.027	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	30.072	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.006	**Gov Vu (k/ft):**	0.051	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	8.243	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.018	**Location (ft):**	0.9
Deflection Ratio:	H/1985	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	7.952	**As min (V) (in^2):**	4.021
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

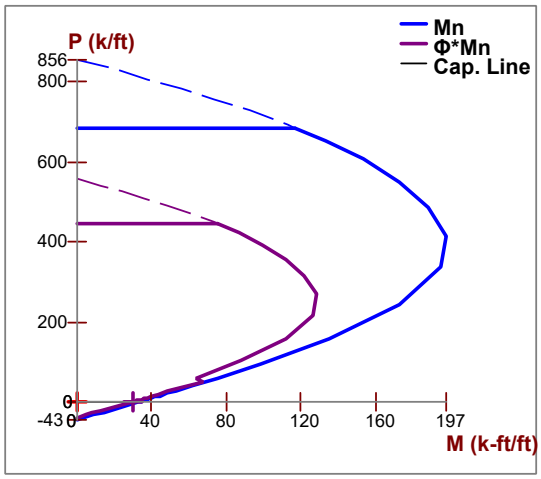
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	6.235
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	353.226		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

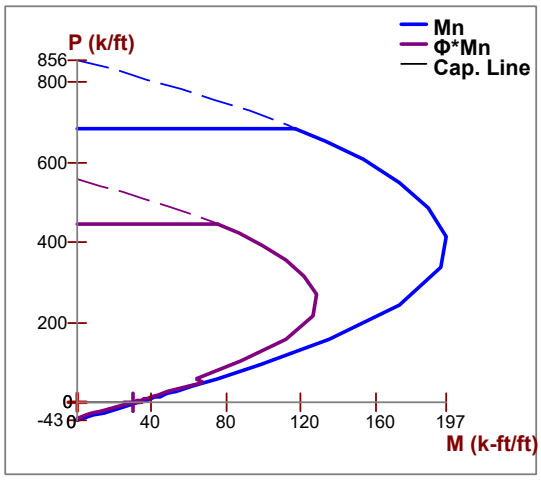
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

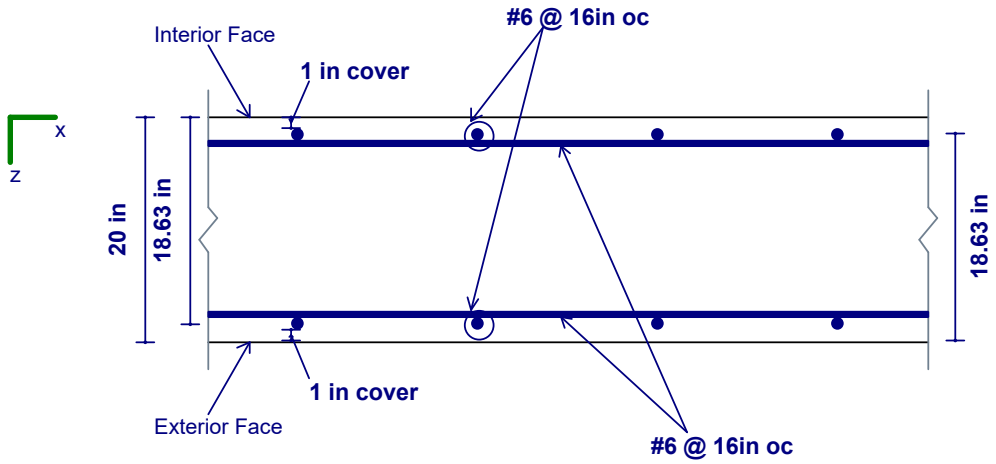
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

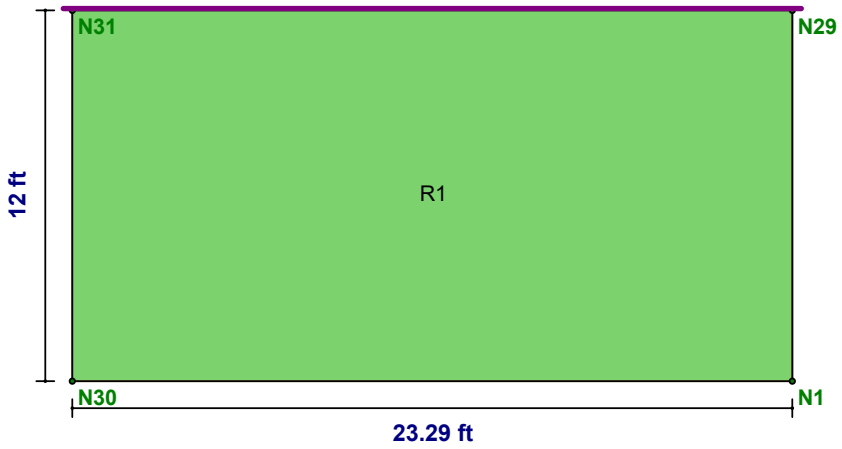


CROSS SECTION DETAILING



Detail Report: WP11

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	23.288	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.04	5	0.027	1	0.001	6	0.403	6	0.431	6	0.004	6

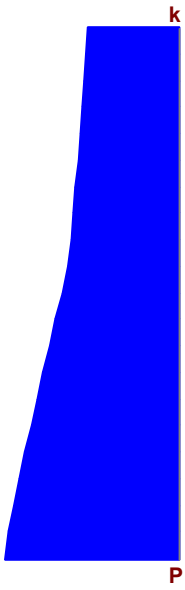
REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A

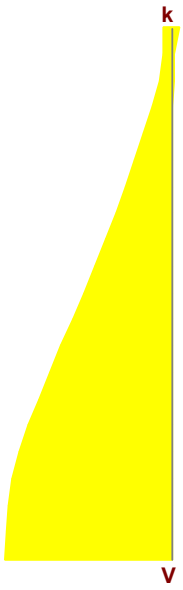
Detail Report: WP11 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	23.288	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

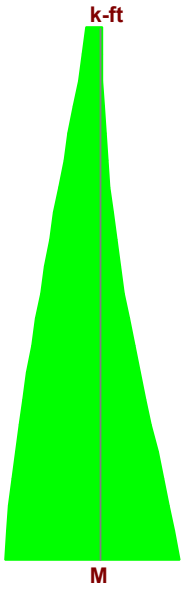
ENVELOPE DIAGRAMS



Min: 76.397 at 12 ft
Max: 147.226 at 0 ft



Min: -1.248 at 12 ft
Max: 29.02 at 0 ft



Min: -307.255 at 0 ft
Max: 366.649 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.04	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	366.649	**Gov LC:**	5
Gov Pu (k):	0	**phi*Mn (k-ft):**	9165.37		

SHEAR DETAILS

UC Max:	0.027	**phi*Vn (k):**	1060.461	**Vs (k):**	925.949
Location (ft):	0	**Vnmax (k):**	1413.948	**Gov LC:**	1
Gov Vu (k):	29.02	**Vc (k):**	530.23		

DEFLECTION DETAILS

Delta max (in):	0.001	**Location (ft):**	12
Deflection Ratio:	H/10000	**Gov LC:**	6

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	4.192
rho Provided (H):	0.007	**As Provided (V) (in^2):**	15.904	**rho min (V):**	0.002
As min (H) (in^2):	2.88	**rho Provided (V):**	0.006		

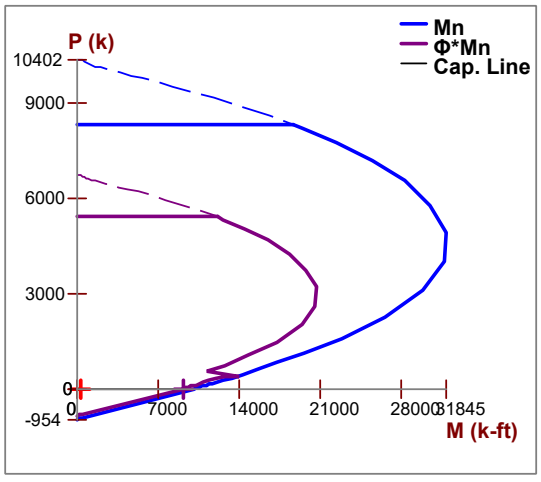
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	23.288	**Icracked (in^4):**	1.273e+7	**KL/r:**	1.785
A (in^2):	2794.56	**Cracked Mom, Mcr (k-ft):**	5145.003		
Igross (in^4):	1.819e+7	**r (in):**	67.495		

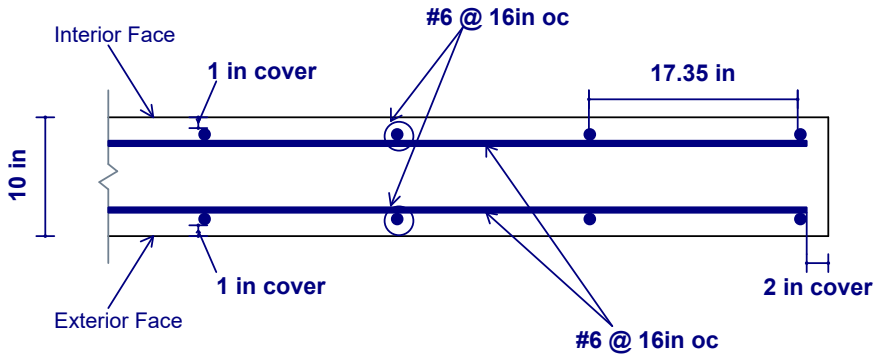
SLENDER BENDING SPAN RESULTS

KL/r in	Cm in	Lu in (ft)	Pc (k)	deltaNS	M act (k-ft)	M2 min (k-ft)	Mc in (k-ft)
1.785	0.648	12	0	N/A	0	0	N/A

IN-PLANE WALL INTERACTION DIAGRAM



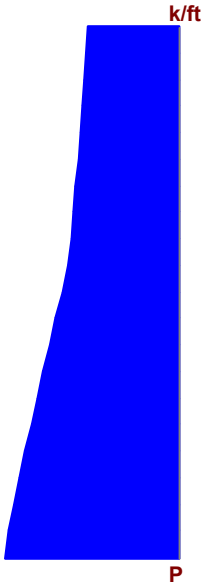
CROSS SECTION DETAILING



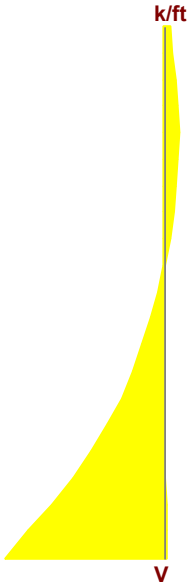
Detail Report: WP11 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	23.288	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

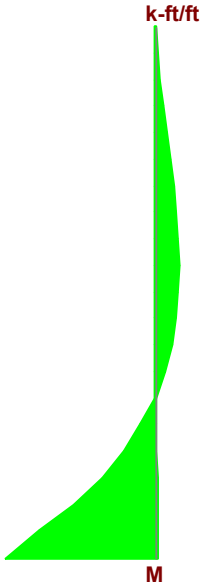
ENVELOPE DIAGRAMS



Min: 3.281 at 12 ft
Max: 6.322 at 0 ft



Min: -0.219 at 9.6 ft
Max: 2.576 at 0 ft



Min: -0.836 at 6.6 ft
Max: 5.465 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.062	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	5.465
Location (ft):	6.6	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z) (k-ft/ft):**	13.556
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.403	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	0	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-0.836	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	13.556	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.431	**Gov Vu (k/ft):**	2.576	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	5.977	**Gov LC:**	6

DEFLECTION DETAILS

Delta max (in):	0.004	**Location (ft):**	12
Deflection Ratio:	H/10000	**Gov LC:**	6

REINFORCEMENT DETAILS

As Provided (V) (in^2):	15.904	**As min (V) (in^2):**	4.192
rho Provided (V):	0.006	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

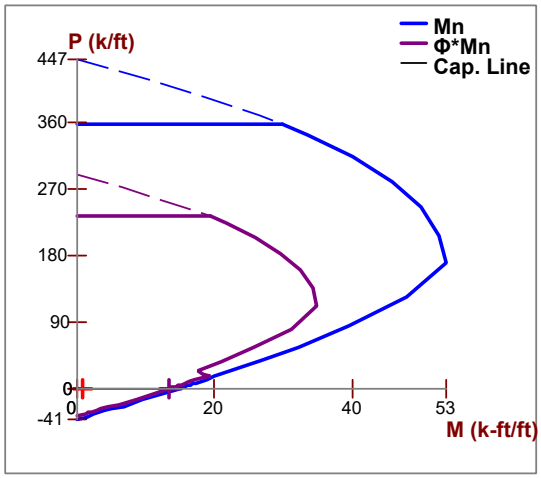
Total Width (in):	16	**Icracked (in^4):**	466.667	**KL/r:**	49.883
A (in^2):	160	**Cracked Mom, Mcr (k-ft):**	184.108		
Igross (in^4):	1333.333	**r (in):**	1.708		

SLENDER BENDING SPAN RESULTS

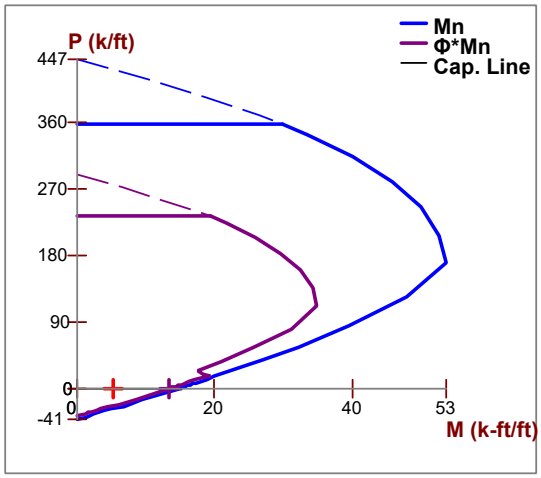
	KL/r out	Cm out	Lu out (ft)	Pc (k/ft)	deltaNS	M act (k-ft/ft)	M2 min (k-ft/ft)	Mc out (k-ft/ft)
Interior	49.883	0.6	12	433.604	1	0.836(6.6ft)	0.208	0.836(6.6ft)
Exterior				433.604	1	-5.465(0ft)	0.09	-5.465(0ft)

OUT-PLANE WALL INTERACTION DIAGRAM

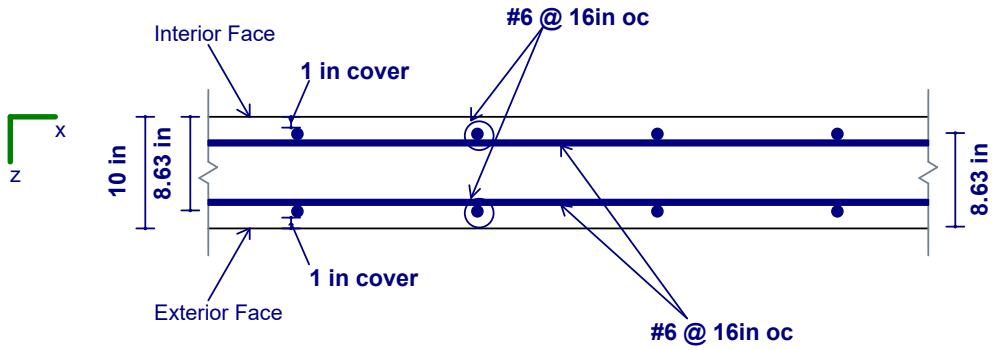
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

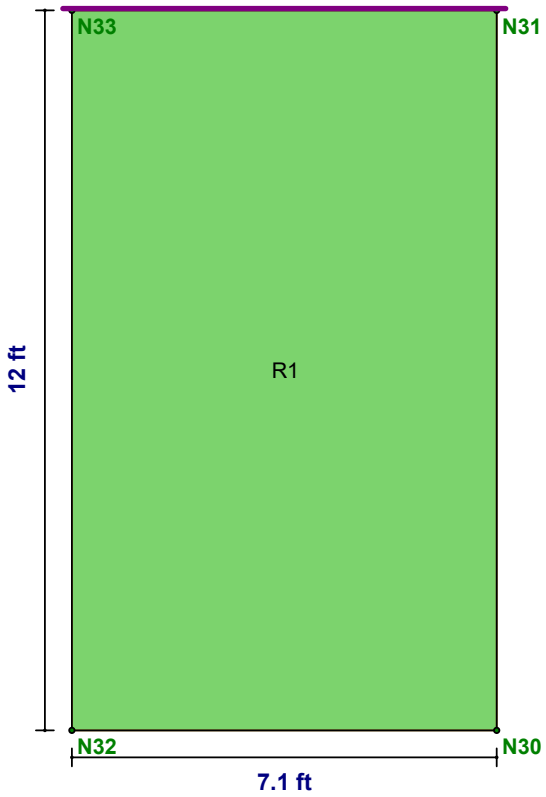


CROSS SECTION DETAILING



Detail Report: WP12

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.104	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.104	1	0.097	1	0.008	1	0.033	2	0.135	6	0.002	6

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP12 (In-Plane, Region R1)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

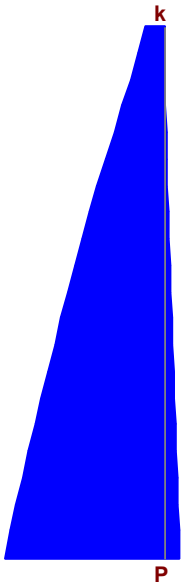
GEOMETRY

Total Height (ft):	12
Total Length (ft):	7.104
Thickness (in):	10
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

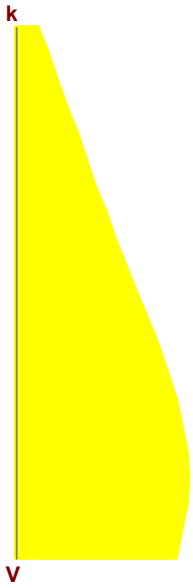
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

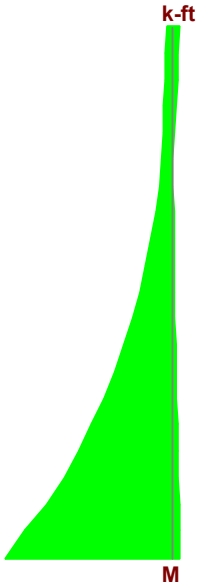
ENVELOPE DIAGRAMS



Min: -1.937 at 0 ft
Max: 21.268 at 0 ft



Min: -30.949 at 1.8 ft
Max: 0.062 at 0 ft



Min: -4.226 at 12 ft
Max: 97.799 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.104	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	97.799	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	942.496		

SHEAR DETAILS

UC Max:	0.097	**phi*Vn (k):**	317.855	**Vs (k):**	282.461
Location (ft):	1.8	**Vnmax (k):**	431.325	**Gov LC:**	1
Gov Vu (k):	-30.949	**Vc (k):**	141.346		

DEFLECTION DETAILS

Delta max (in):	0.008	**Location (ft):**	12
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	1.279
rho Provided (H):	0.007	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	2.88	**rho Provided (V):**	0.006		

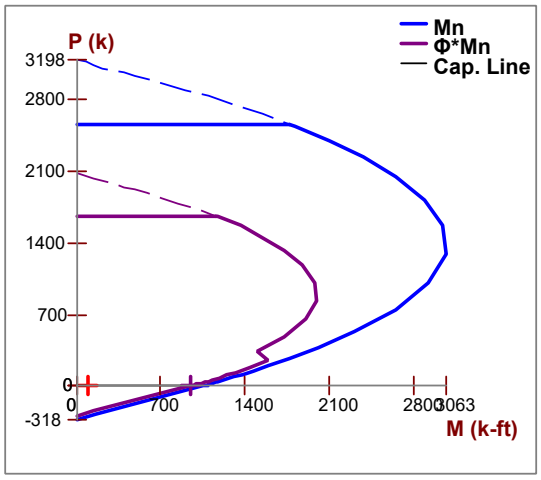
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.104	**Icracked (in^4):**	3.614e+5	**KL/r:**	5.852
A (in^2):	852.48	**Cracked Mom, Mcr (k-ft):**	478.77		
Igross (in^4):	5.163e+5	**r (in):**	20.589		

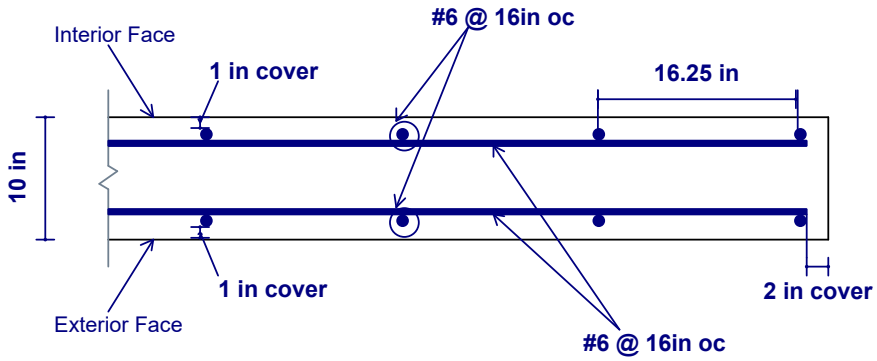
SLENDER BENDING SPAN RESULTS

KL/r in	Cm in	Lu in (ft)	Pc (k)	deltaNS	M act (k-ft)	M2 min (k-ft)	Mc in (k-ft)
5.852	0.588	12	0	N/A	0	0	N/A

IN-PLANE WALL INTERACTION DIAGRAM



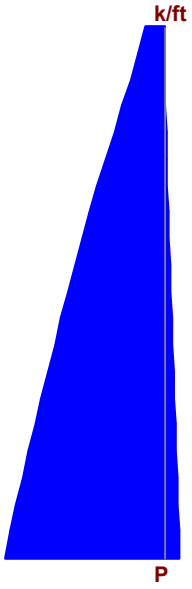
CROSS SECTION DETAILING



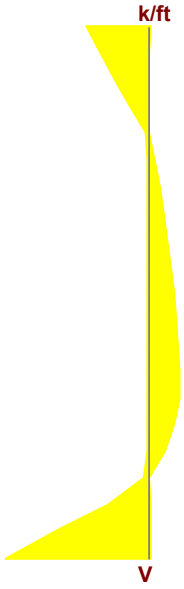
Detail Report: WP12 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.104	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

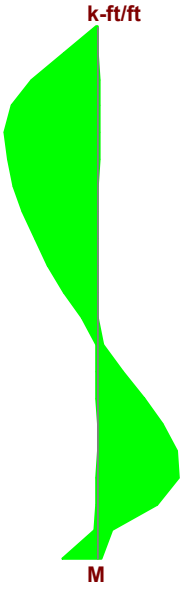
ENVELOPE DIAGRAMS



Min: -0.273 at 0 ft
Max: 2.994 at 0 ft



Min: -0.176 at 4.2 ft
Max: 0.815 at 0 ft



Min: -0.427 at 1.8 ft
Max: 0.48 at 9.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.029	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.48
Location (ft):	1.8	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z) (k-ft/ft):**	14.642
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.033	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	9.6	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.427	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	14.642	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.135	**Gov Vu (k/ft):**	0.815	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	6.033	**Gov LC:**	6

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	12
Deflection Ratio:	H/10000	**Gov LC:**	6

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	1.279
rho Provided (V):	0.006	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

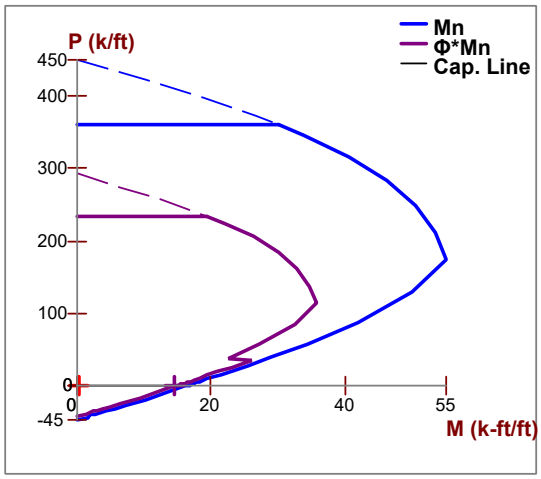
Total Width (in):	16	**Icracked (in^4):**	466.667	**KL/r:**	49.883
A (in^2):	160	**Cracked Mom, Mcr (k-ft):**	56.162		
Igross (in^4):	1333.333	**r (in):**	1.708		

SLENDER BENDING SPAN RESULTS

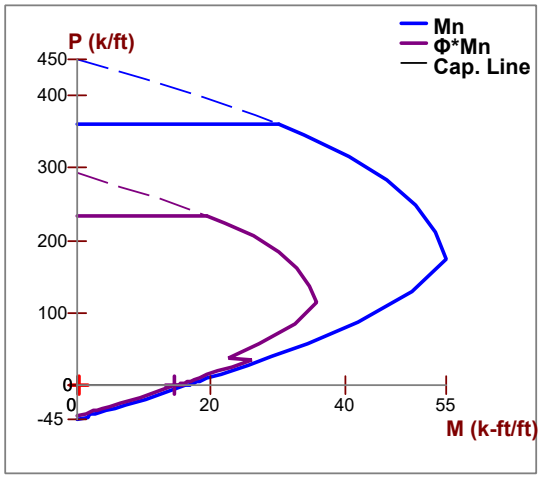
	KL/r out	Cm out	Lu out (ft)	Pc (k/ft)	deltaNS	M act (k-ft/ft)	M2 min (k-ft/ft)	Mc out (k-ft/ft)
Interior	49.883	0.6	12	433.604	1	0.427(1.8ft)	0.157	0.427(1.8ft)
Exterior				433.604	1	-0.48(9.6ft)	0.002	-0.48(9.6ft)

OUT-PLANE WALL INTERACTION DIAGRAM

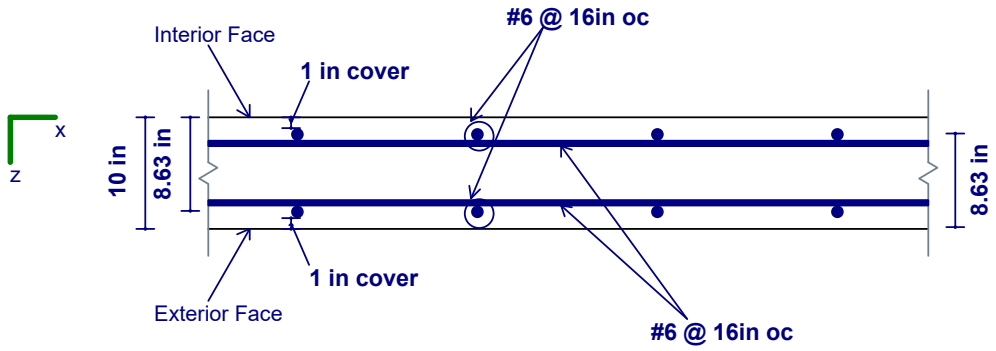
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

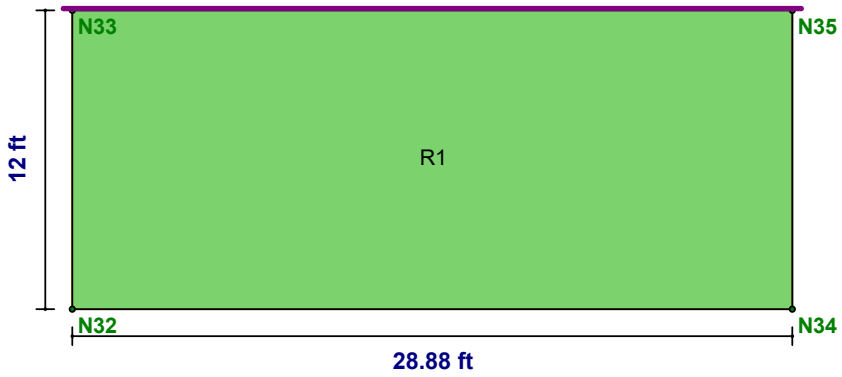


CROSS SECTION DETAILING



Detail Report: WP13

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	R5	**Total Length (ft):**	28.878	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#5	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R1	0.028	1	0.012	1	0.001	1	0.844	1	0.599	6	0.28	1

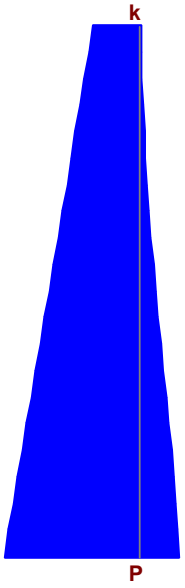
REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R1	#6@16in oc e.f.	#5@16in oc e.f.	N/A

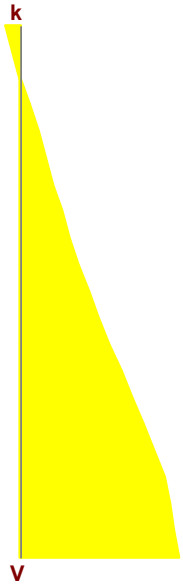
Detail Report: WP13 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	R5	**Total Length (ft):**	28.878	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#5	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

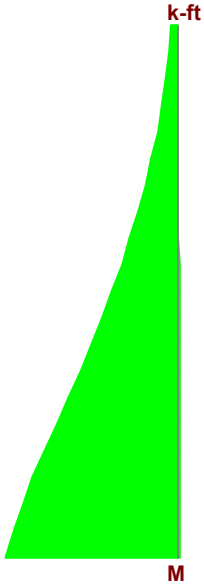
ENVELOPE DIAGRAMS



Min: -21.073 at 0 ft
Max: 71.863 at 0 ft



Min: -12.89 at 0 ft
Max: 1.246 at 12 ft



Min: -5.735 at 0 ft
Max: 393.14 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.028	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	393.14	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	13888.227		

SHEAR DETAILS

UC Max:	0.012	**phi*Vn (k):**	1091.156	**Vs (k):**	797.369
Location (ft):	0	**Vnmax (k):**	1753.349	**Gov LC:**	1
Gov Vu (k):	-12.89	**Vc (k):**	657.506		

DEFLECTION DETAILS

Delta max (in):	0.0009998	**Location (ft):**	12
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	6.75	**rho min (H):**	0.002	**As min (V) (in^2):**	5.198
rho Provided (H):	0.005	**As Provided (V) (in^2):**	19.439	**rho min (V):**	0.002
As min (H) (in^2):	2.88	**rho Provided (V):**	0.006		

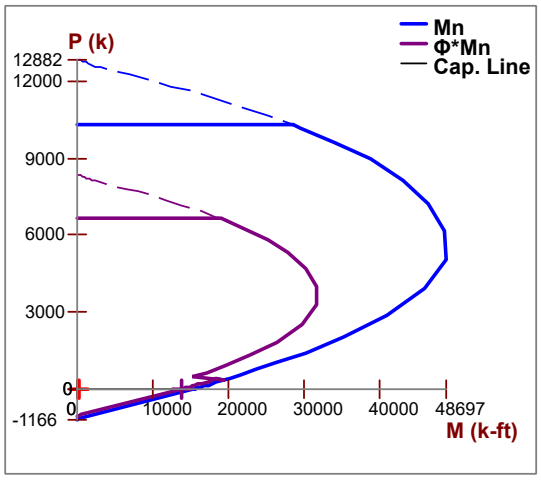
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	28.878	**Icracked (in^4):**	2.428e+7	**KL/r:**	1.439
A (in^2):	3465.36	**Cracked Mom, Mcr (k-ft):**	7911.439		
Igross (in^4):	3.468e+7	**r (in):**	83.696		

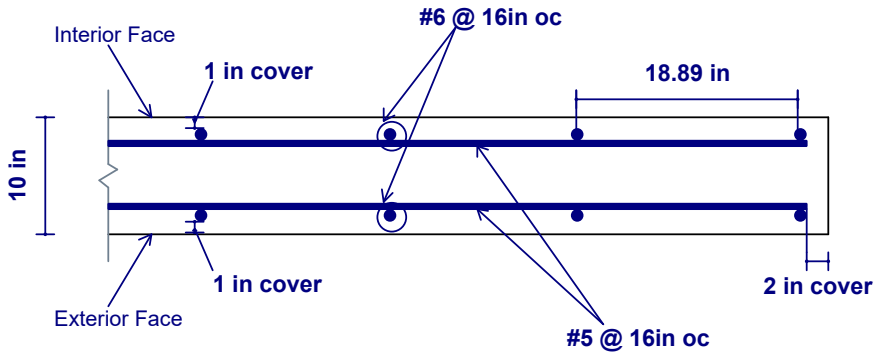
SLENDER BENDING SPAN RESULTS

KL/r in	Cm in	Lu in (ft)	Pc (k)	deltaNS	M act (k-ft)	M2 min (k-ft)	Mc in (k-ft)
1.439	0.612	12	0	N/A	0	0	N/A

IN-PLANE WALL INTERACTION DIAGRAM



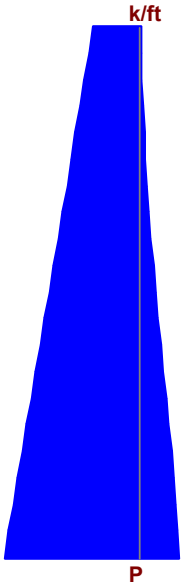
CROSS SECTION DETAILING



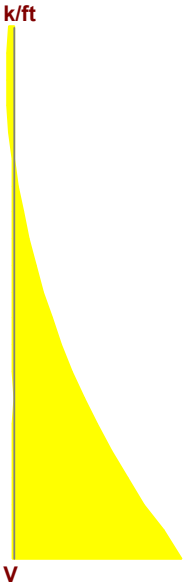
Detail Report: WP13 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	R5	**Total Length (ft):**	28.878	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#5	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

ENVELOPE DIAGRAMS



Min: -0.73 at 0 ft
Max: 2.488 at 0 ft



Min: -3.441 at 0 ft
Max: 0.109 at 10.8 ft

Min: -11.301 at 0 ft
Max: 0.239 at 9 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.844	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.239
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z) (k-ft/ft):**	13.387
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.018	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	9	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-11.301	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	13.387	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.599	**Gov Vu (k/ft):**	-3.441	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	5.74	**Gov LC:**	6

DEFLECTION DETAILS

Delta max (in):	0.28	**Location (ft):**	12
Deflection Ratio:	H/513	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	19.439	**As min (V) (in^2):**	5.198
rho Provided (V):	0.006	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

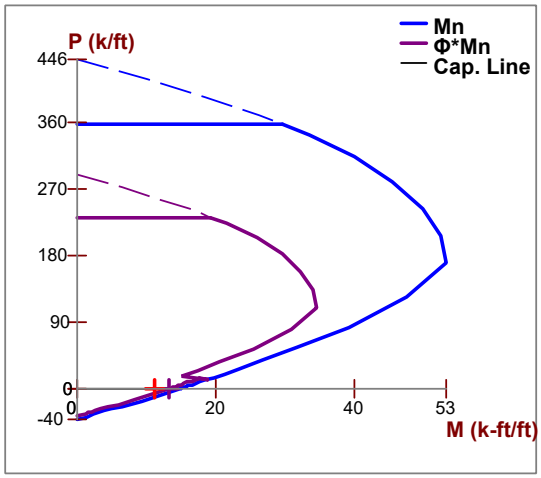
Total Width (in):	16	**Icracked (in^4):**	466.667	**KL/r:**	49.883
A (in^2):	160	**Cracked Mom, Mcr (k-ft):**	228.301		
Igross (in^4):	1333.333	**r (in):**	1.708		

SLENDER BENDING SPAN RESULTS

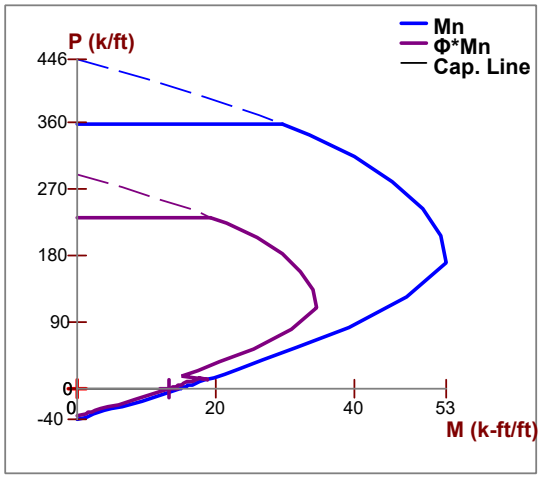
	KL/r out	Cm out	Lu out (ft)	Pc (k/ft)	deltaNS	M act (k-ft/ft)	M2 min (k-ft/ft)	Mc out (k-ft/ft)
Interior	49.883	0.6	12	433.604	1	11.301(0ft)	0.093	11.301(0ft)
Exterior				15.015	1	-0.008(9ft)	0.003	N/A(9ft)

OUT-PLANE WALL INTERACTION DIAGRAM

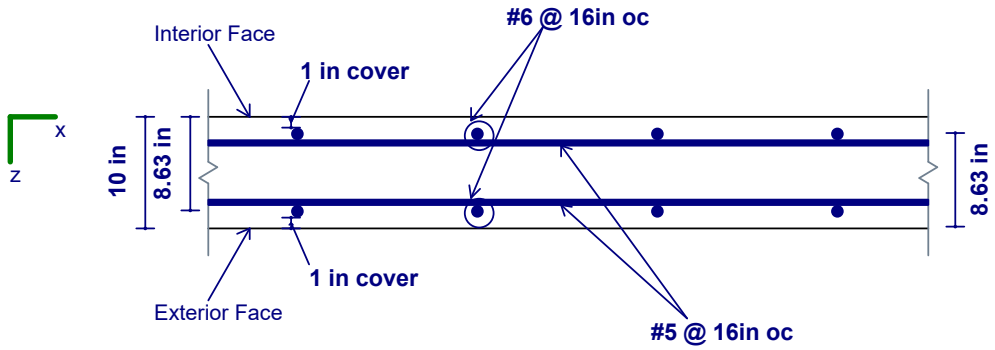
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

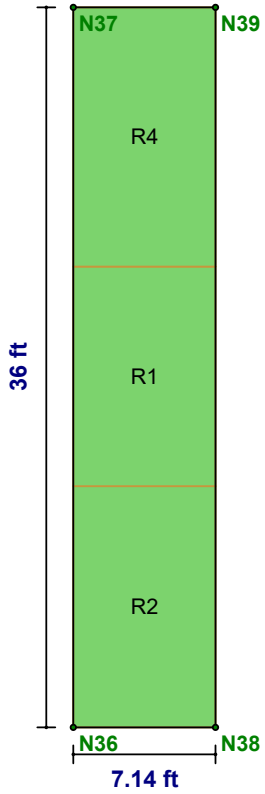


CROSS SECTION DETAILING



Detail Report: WP14

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	36	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.129	1	0.186	1	0.019	1	0.096	1	0.141	2	0.087	2
R1	0.042	1	0.138	5	0.022	1	0.042	1	0.015	5	0.056	5
R4	0.032	1	0.024	5	0.021	5	0.026	5	0.021	1	0.061	2

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP14 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

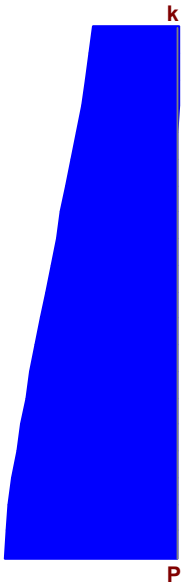
GEOMETRY

Total Height (ft):	12
Total Length (ft):	7.142
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

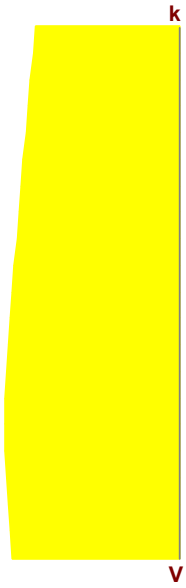
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

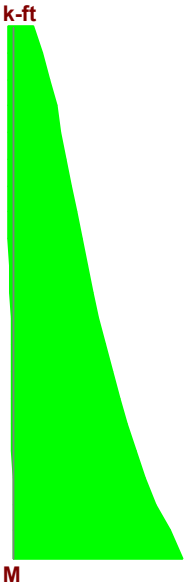
ENVELOPE DIAGRAMS



Min: -2.258 at 12 ft
Max: 304.472 at 0 ft



Min: -0.225 at 12 ft
Max: 79.339 at 3 ft



Min: -447.167 at 0 ft
Max: 10.904 at 9.6 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.129	**phi*Pn (k):**	2368.332	**phi eff.:**	0.65
Location (ft):	0	**Gov Mu (k-ft):**	-447.167	**Gov LC:**	1
Gov Pu (k):	304.472	**phi*Mn (k-ft):**	3478.287		

SHEAR DETAILS

UC Max:	0.186	**phi*Vn (k):**	427.643	**Vs (k):**	283.991
Location (ft):	3	**Vnmax (k):**	867.324	**Gov LC:**	1
Gov Vu (k):	79.339	**Vc (k):**	286.199		

DEFLECTION DETAILS

Delta max (in):	0.019	**Location (ft):**	36
Deflection Ratio:	H/7625	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	2.571
rho Provided (H):	0.003	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	5.76	**rho Provided (V):**	0.003		

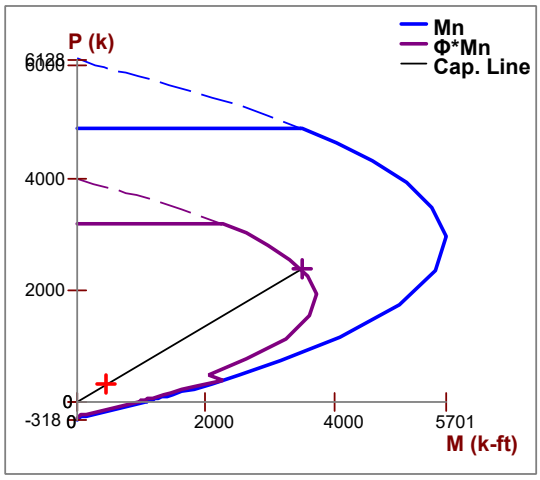
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	5.82
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

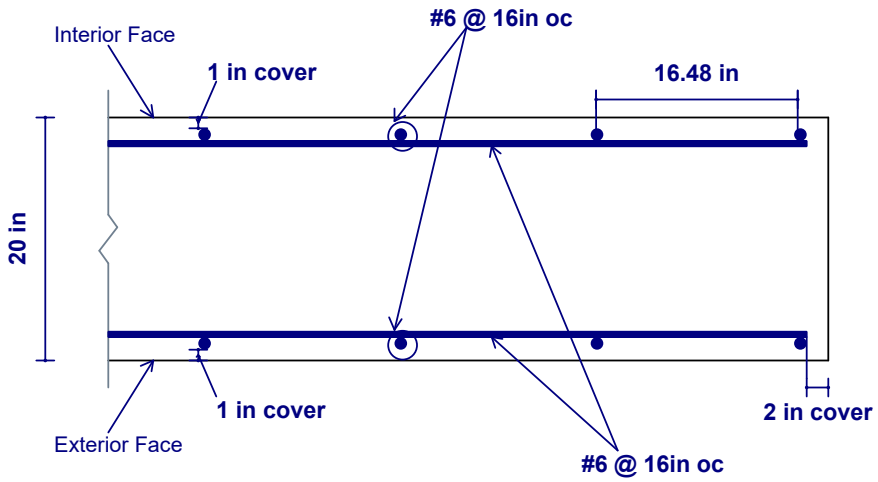
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



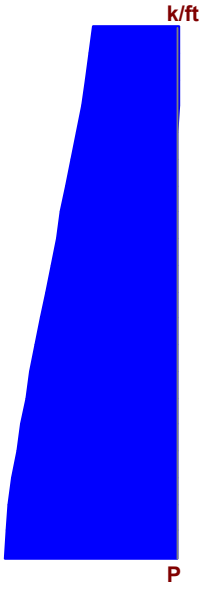
CROSS SECTION DETAILING



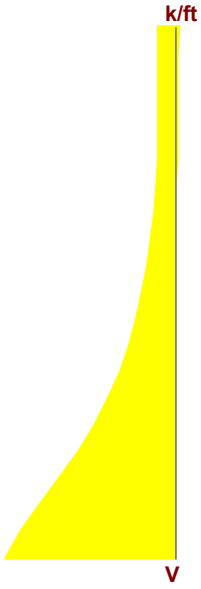
Detail Report: WP14 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

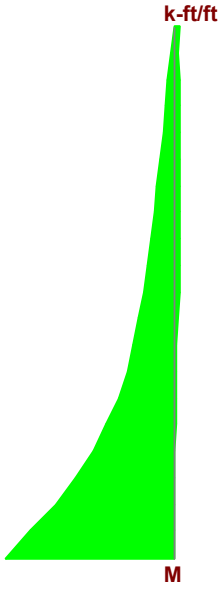
ENVELOPE DIAGRAMS



Min: -0.316 at 12 ft
Max: 42.628 at 0 ft



Min: -0.029 at 12 ft
Max: 1.791 at 0 ft



Min: -0.235 at 8.4 ft
Max: 6.617 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.096	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	6.617
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z) (k-ft/ft):**	69.255
Gov Pu Int (-z) (k/ft):	42.628	**UC Max Ext (+z):**	0.096	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	446.166	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	42.628		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	446.166		

SHEAR DETAILS

UC Max:	0.141	**Gov Vu (k/ft):**	1.746	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	12.359	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.087	**Location (ft):**	36
Deflection Ratio:	H/1664	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	2.571
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

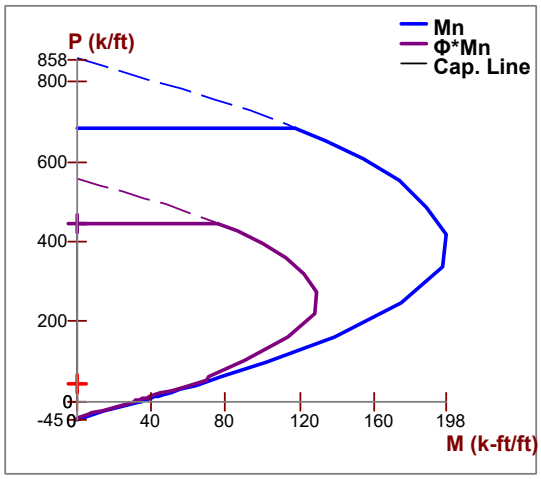
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	24.942
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

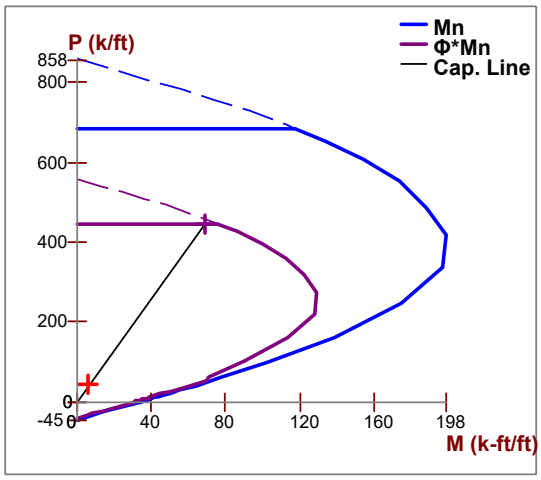
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

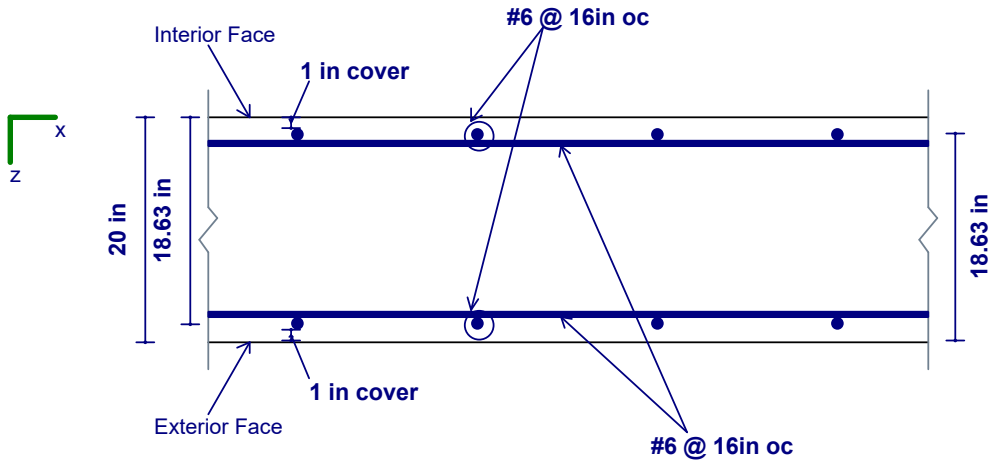
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



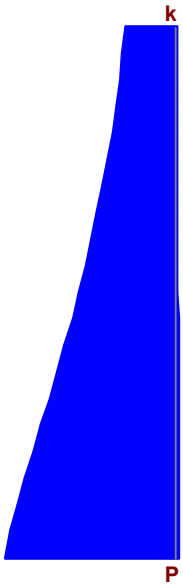
CROSS SECTION DETAILING



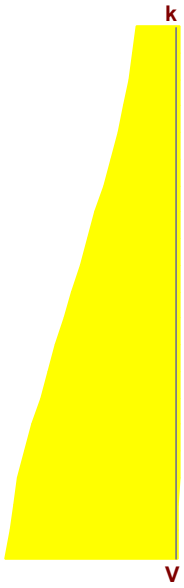
Detail Report: WP14 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

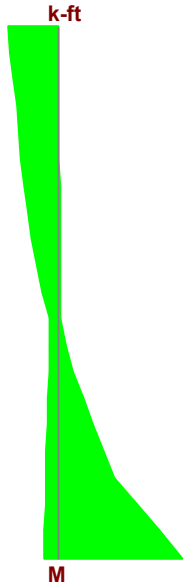
ENVELOPE DIAGRAMS



Min: -2.457 at 1.65 ft
Max: 133.51 at 0 ft



Min: -1.479 at 4.95 ft
Max: 62.326 at 0 ft



Min: -99.525 at 0 ft
Max: 39.761 at 11 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.042	**phi*Pn (k):**	3186.738	**phi eff.:**	0.65
Location (ft):	0	**Gov Mu (k-ft):**	-90.799	**Gov LC:**	1
Gov Pu (k):	133.51	**phi*Mn (k-ft):**	2167.275		

SHEAR DETAILS

UC Max:	0.138	**phi*Vn (k):**	450.411	**Vs (k):**	283.991
Location (ft):	0	**Vnmax (k):**	867.324	**Gov LC:**	5
Gov Vu (k):	62.326	**Vc (k):**	316.557		

DEFLECTION DETAILS

Delta max (in):	0.022	**Location (ft):**	36
Deflection Ratio:	H/6022	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	2.571
rho Provided (H):	0.003	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

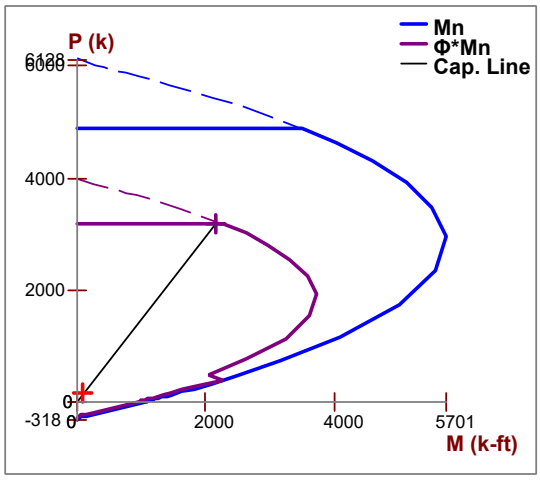
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	5.335
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

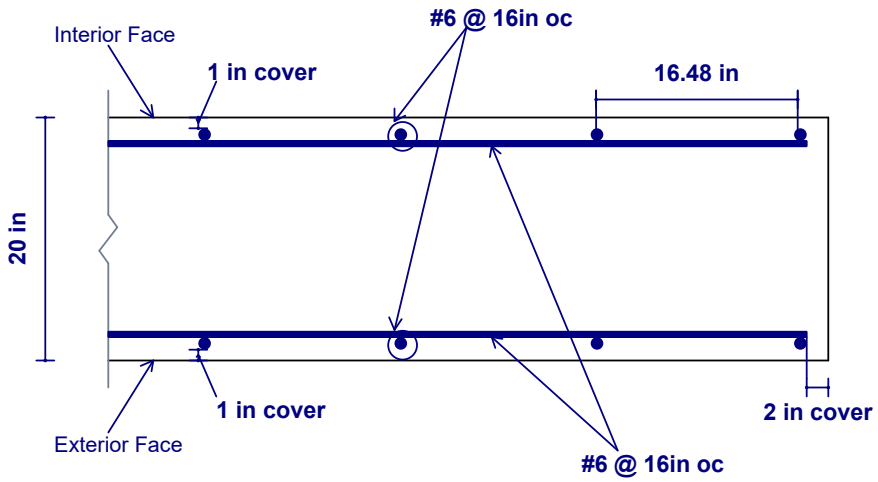
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



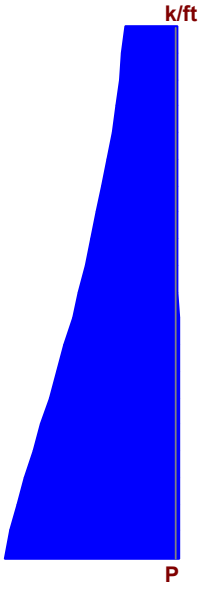
CROSS SECTION DETAILING



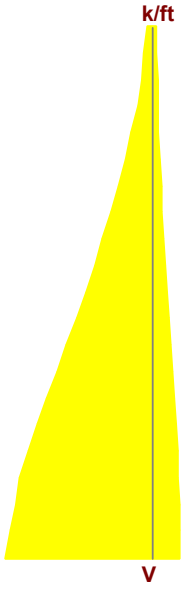
Detail Report: WP14 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

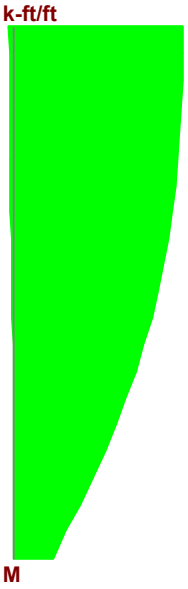
ENVELOPE DIAGRAMS



Min: -0.344 at 1.65 ft
Max: 18.692 at 0 ft



Min: -0.029 at 0 ft
Max: 0.153 at 0 ft



Min: -0.818 at 11 ft
Max: 0.013 at 11 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.042	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	18.692	**UC Max Ext (+z):**	0.042	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	446.166	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	18.692		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	446.166		

SHEAR DETAILS

UC Max:	0.015	**Gov Vu (k/ft):**	0.153	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	9.933	**Gov LC:**	5

DEFLECTION DETAILS

Delta max (in):	0.056	**Location (ft):**	36
Deflection Ratio:	H/2373	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	2.571
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

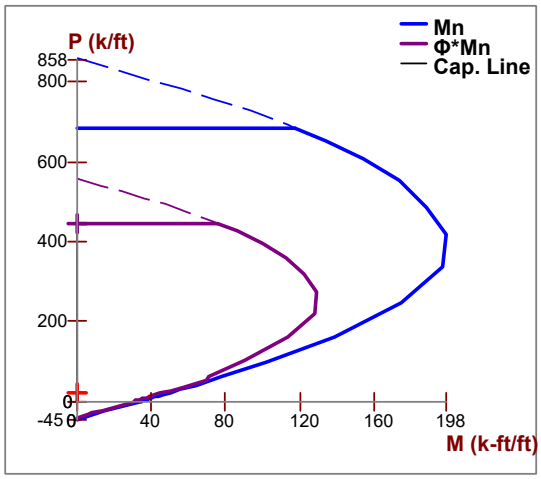
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

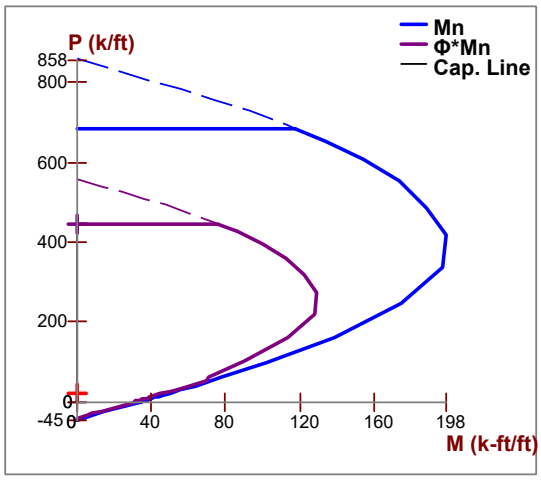
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

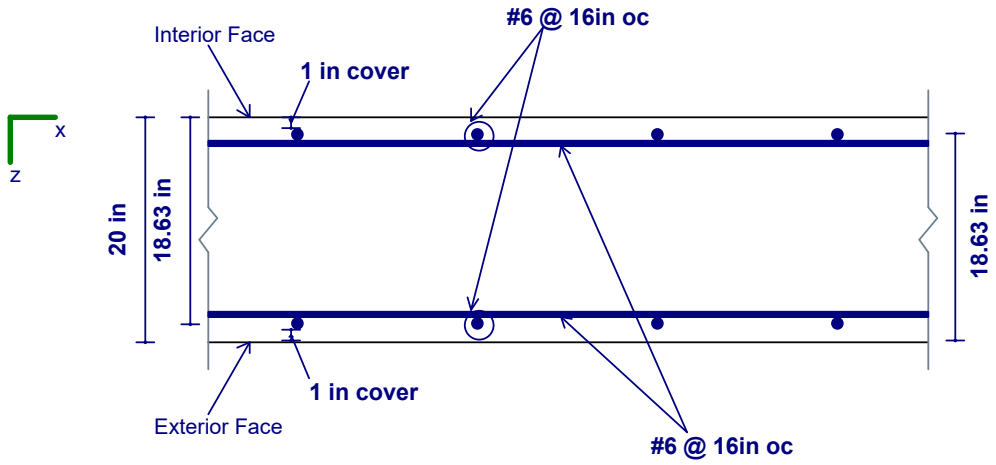
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



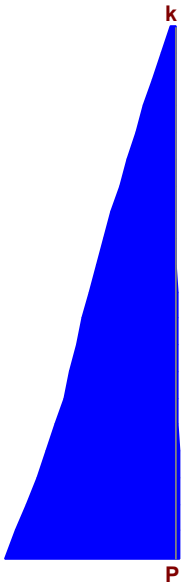
CROSS SECTION DETAILING



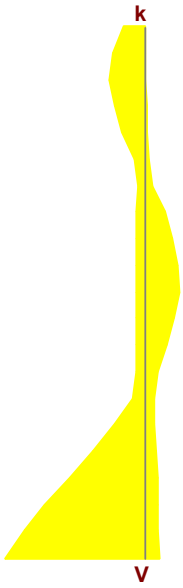
Detail Report: WP14 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

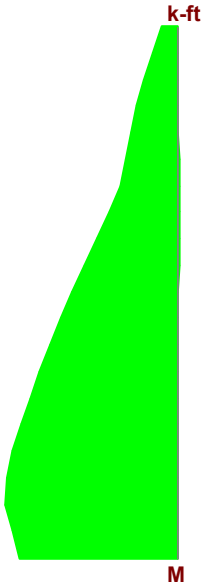
ENVELOPE DIAGRAMS



Min: -0.925 at 0 ft
Max: 35.149 at 0 ft



Min: -2.34 at 6.5 ft
Max: 9.683 at 0 ft



Min: -0.201 at 8.45 ft
Max: 31.455 at 1.3 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.032	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	1.3	**Gov Mu (k-ft):**	31.455	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	971.459		

SHEAR DETAILS

UC Max:	0.024	**phi*Vn (k):**	404.874	**Vs (k):**	283.991
Location (ft):	0	**Vnmax (k):**	867.324	**Gov LC:**	5
Gov Vu (k):	9.683	**Vc (k):**	255.841		

DEFLECTION DETAILS

Delta max (in):	0.021	**Location (ft):**	36
Deflection Ratio:	H/7336	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (H) (in^2):	10.603	**rho min (H):**	0.002	**As min (V) (in^2):**	2.571
rho Provided (H):	0.003	**As Provided (V) (in^2):**	5.301	**rho min (V):**	0.002
As min (H) (in^2):	6.24	**rho Provided (V):**	0.003		

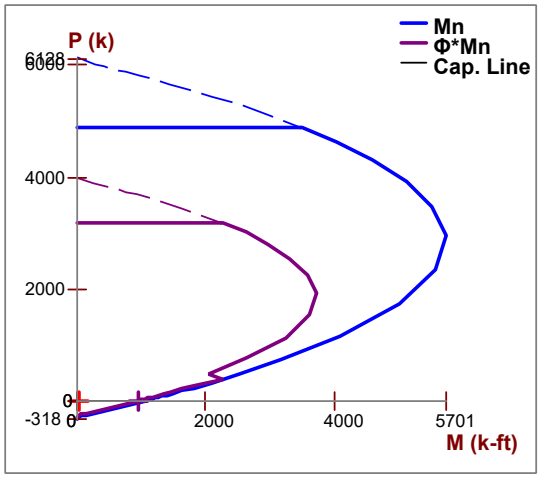
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	7.142	**Icracked (in^4):**	7.346e+5	**KL/r:**	6.305
A (in^2):	1714.2	**Cracked Mom, Mcr (k-ft):**	967.947		
Igross (in^4):	1.049e+6	**r (in):**	20.701		

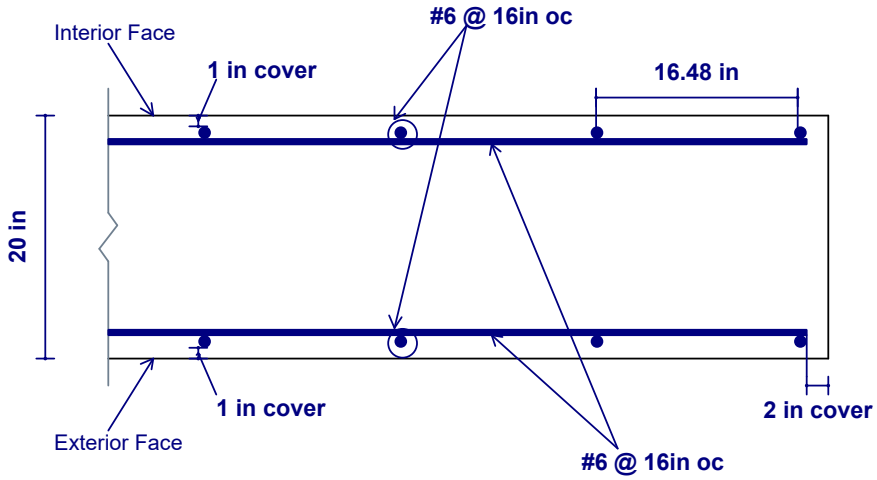
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



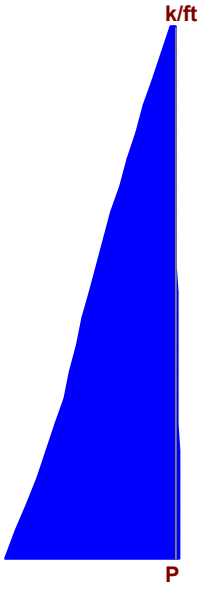
CROSS SECTION DETAILING



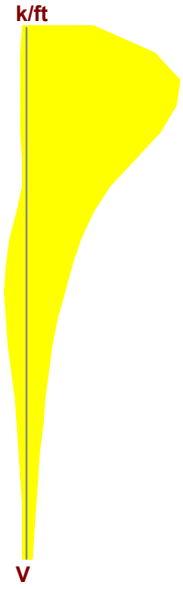
Detail Report: WP14 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	13	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	7.142	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

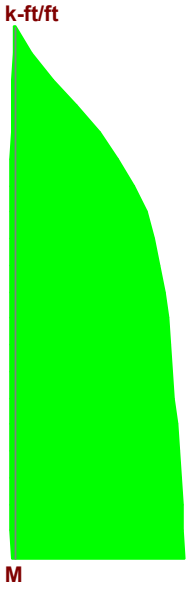
ENVELOPE DIAGRAMS



Min: -0.13 at 0 ft
Max: 4.921 at 0 ft



Min: -0.182 at 11.7 ft
Max: 0.024 at 6.5 ft



Min: -0.818 at 0 ft
Max: 0.018 at 4.55 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.026	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.019
Location (ft):	0	**Gov LC Int (-z):**	5	**phi*Mn Ext (+z) (k-ft/ft):**	31.274
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.001	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	4.55	**Gov LC Ext (+z):**	6
Gov Mu Int (-z) (k-ft/ft):	-0.818	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	31.274	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.021	**Gov Vu (k/ft):**	-0.182	**phi*Vns (k/ft):**	0
Location (ft):	11.7	**phi*Vnc (k/ft):**	8.463	**Gov LC:**	1

DEFLECTION DETAILS

Delta max (in):	0.061	**Location (ft):**	1.8
Deflection Ratio:	H/2550	**Gov LC:**	2

REINFORCEMENT DETAILS

As Provided (V) (in^2):	5.301	**As min (V) (in^2):**	2.571
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

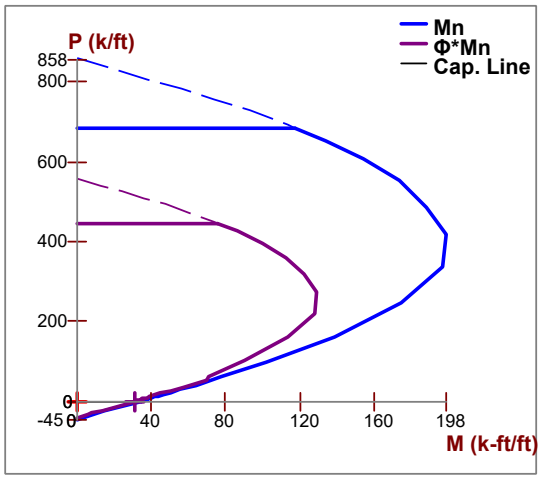
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	27.02
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	225.866		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

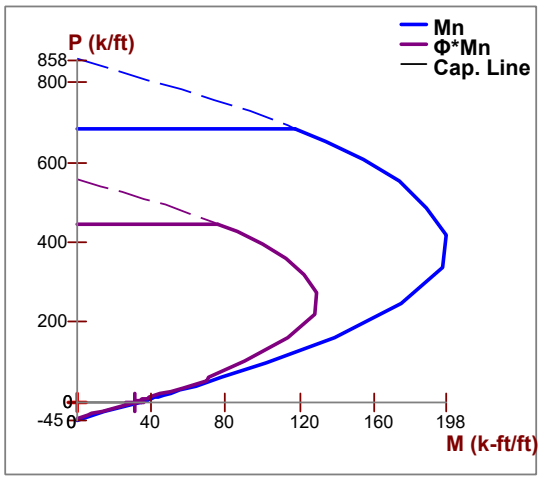
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

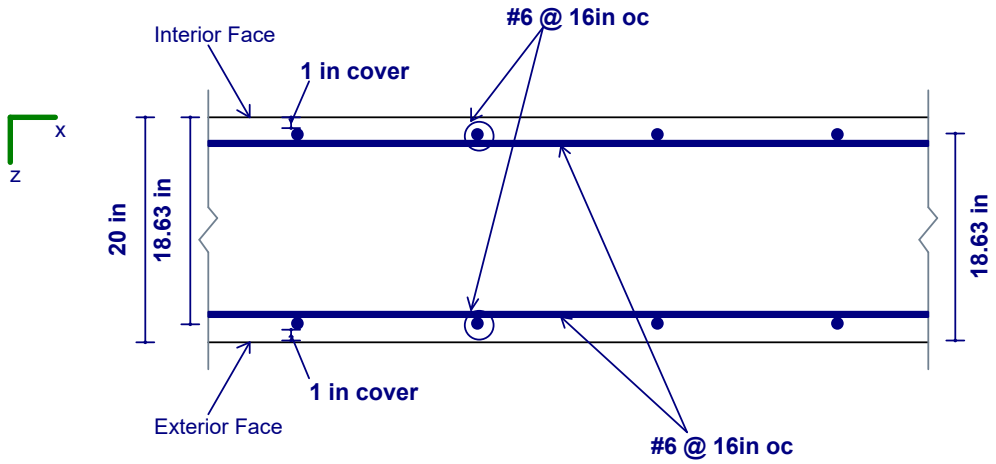
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

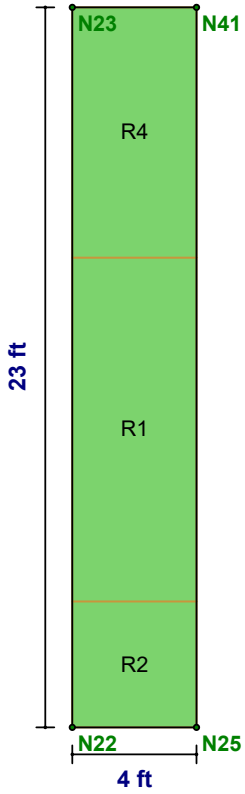


CROSS SECTION DETAILING



Detail Report: WP15

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	23	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.493	2	0.1	2	0.002	1	0.493	2	0.009	2	0.005	1
R1	0.308	2	0.092	2	0.011	1	0.308	2	0.01	2	0.005	1
R4	0.009	2	0.012	1	0.008	1	0.017	2	0.066	2	0.004	1

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R1	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R4	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP15 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

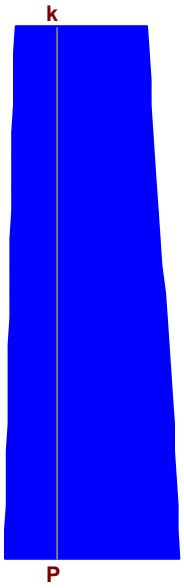
GEOMETRY

Total Height (ft):	4
Total Length (ft):	4
Thickness (in):	20
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

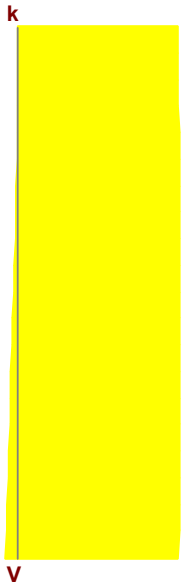
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

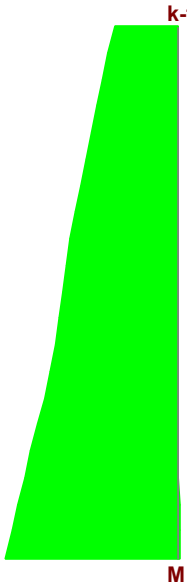
ENVELOPE DIAGRAMS



Min: -70.55 at 0 ft
Max: 28.806 at 0 ft



Min: -19.881 at 1.6 ft
Max: 1.235 at 0 ft



Min: -0.69 at 0 ft
Max: 62.18 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.493	**phi*Pn (k):**	-143.139	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	61.453	**Gov LC:**	2
Gov Pu (k):	-70.55	**phi*Mn (k-ft):**	124.683		

SHEAR DETAILS

UC Max:	0.1	**phi*Vn (k):**	197.956	**Vs (k):**	159.043
Location (ft):	1.4	**Vnmax (k):**	485.726	**Gov LC:**	2
Gov Vu (k):	-19.874	**Vc (k):**	104.898		

DEFLECTION DETAILS

Delta max (in):	0.002	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	4.418	**rho min (H):**	0.002	**As min (V) (in^2):**	1.44
rho Provided (H):	0.005	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.002
As min (H) (in^2):	1.92	**rho Provided (V):**	0.003		

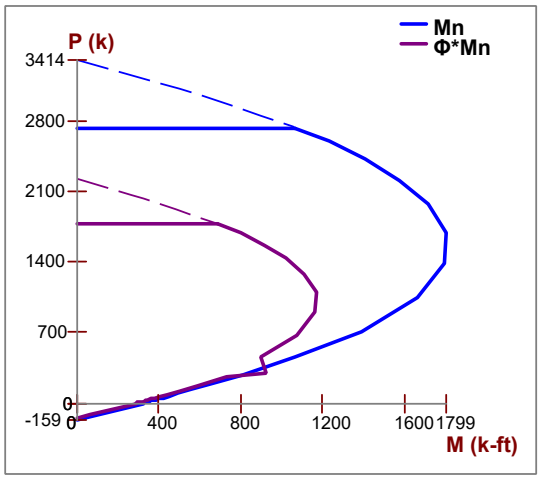
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	4	**Icracked (in^4):**	1.29e+5	**KL/r:**	3.464
A (in^2):	960	**Cracked Mom, Mcr (k-ft):**	303.579		
Igross (in^4):	1.843e+5	**r (in):**	11.593		

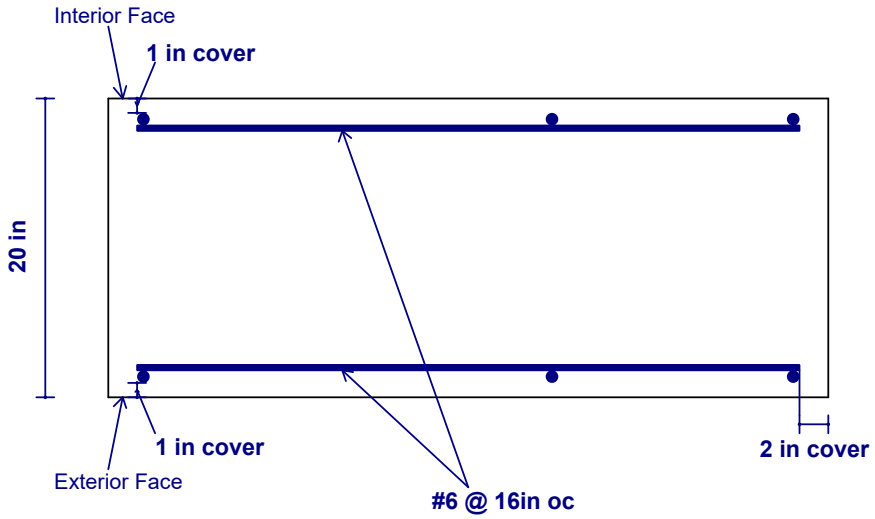
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



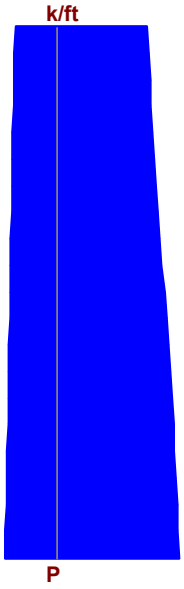
CROSS SECTION DETAILING



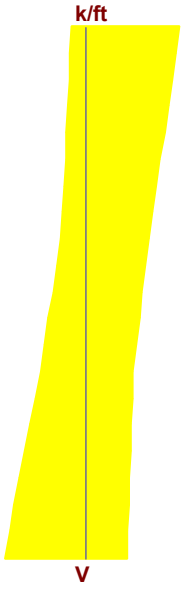
Detail Report: WP15 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	4	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

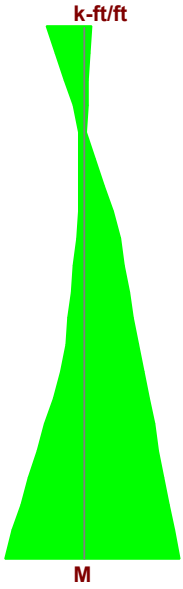
ENVELOPE DIAGRAMS



Min: -17.637 at 0 ft
Max: 7.201 at 0 ft



Min: -0.145 at 4 ft
Max: 0.124 at 0 ft



Min: -0.226 at 0 ft
Max: 0.186 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.493	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	-17.637	**UC Max Ext (+z):**	0.493	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	-35.785	**Location (ft):**	0	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	-17.637		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	-35.785		

SHEAR DETAILS

UC Max:	0.009	**Gov Vu (k/ft):**	-0.145	**phi*Vns (k/ft):**	16.592
Location (ft):	4	**phi*Vnc (k/ft):**	6.586	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	23
Deflection Ratio:	H/9201	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.44
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

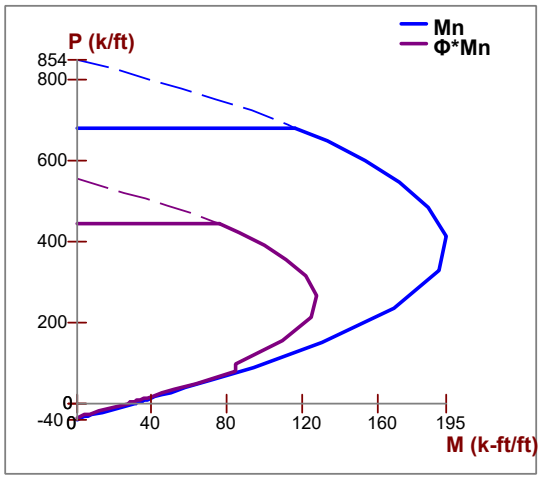
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	8.314
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	126.491		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

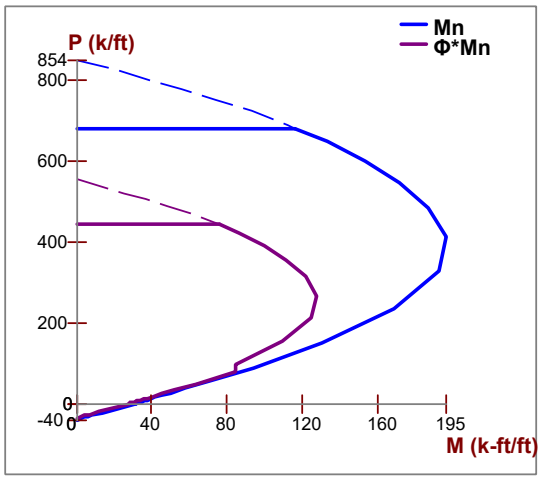
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

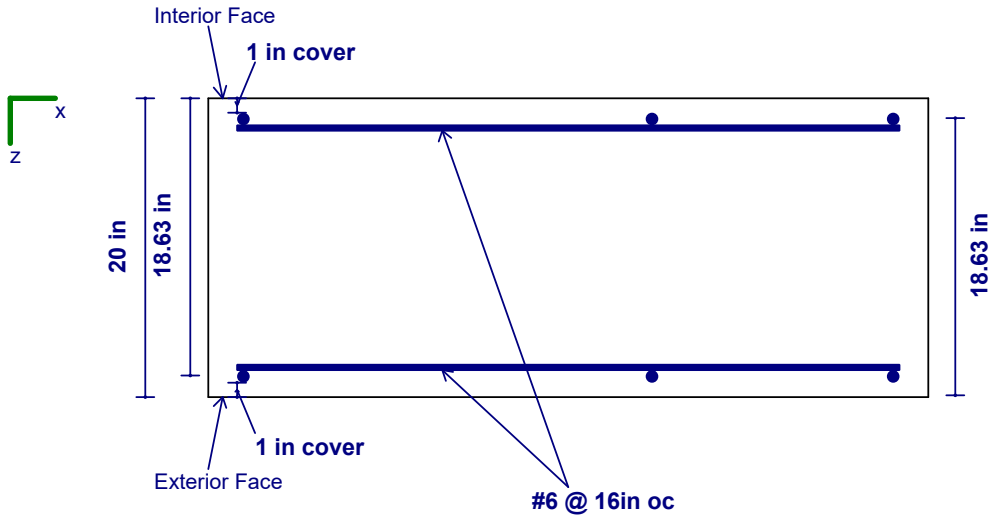
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



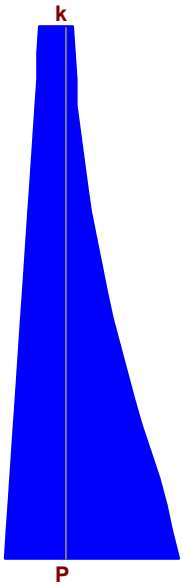
CROSS SECTION DETAILING



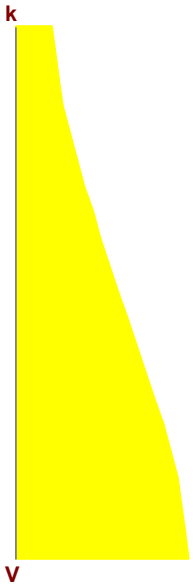
Detail Report: WP15 (In-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

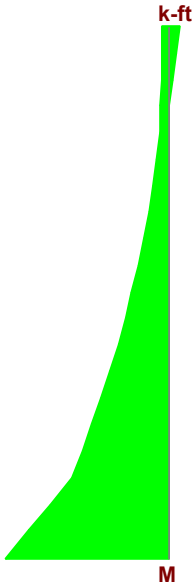
ENVELOPE DIAGRAMS



Min: -44.042 at 0 ft
Max: 23.323 at 0 ft



Min: -18.857 at 0 ft
Max: -3.843 at 11 ft



Min: -2.716 at 11 ft
Max: 37.527 at 0 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.308	**phi*Pn (k):**	-143.139	**phi eff.:**	0.9
Location (ft):	0	**Gov Mu (k-ft):**	35.709	**Gov LC:**	2
Gov Pu (k):	-44.042	**phi*Mn (k-ft):**	116.057		

SHEAR DETAILS

UC Max:	0.092	**phi*Vn (k):**	202	**Vs (k):**	159.043
Location (ft):	0	**Vnmax (k):**	485.726	**Gov LC:**	2
Gov Vu (k):	-18.602	**Vc (k):**	110.29		

DEFLECTION DETAILS

Delta max (in):	0.011	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	1.44
rho Provided (H):	0.003	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.002
As min (H) (in^2):	5.28	**rho Provided (V):**	0.003		

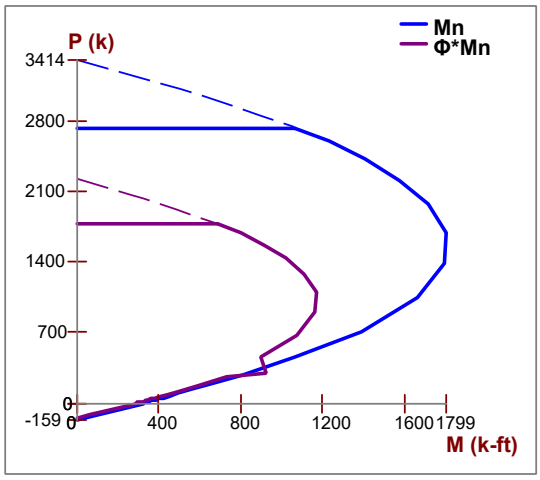
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	4	**Icracked (in^4):**	1.29e+5	**KL/r:**	9.526
A (in^2):	960	**Cracked Mom, Mcr (k-ft):**	303.579		
Igross (in^4):	1.843e+5	**r (in):**	11.593		

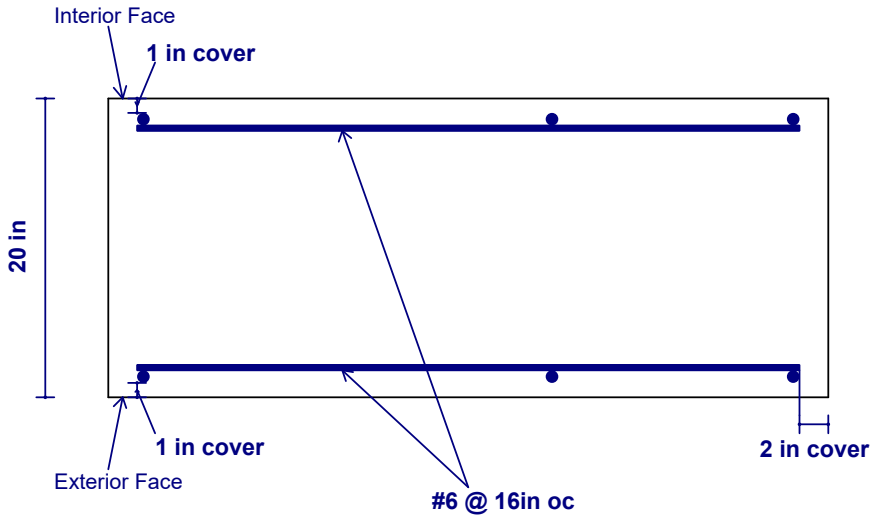
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



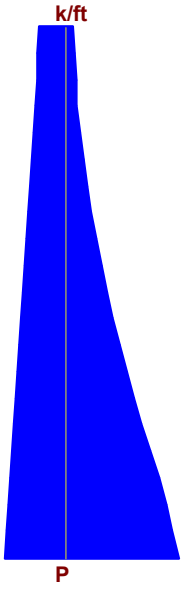
CROSS SECTION DETAILING



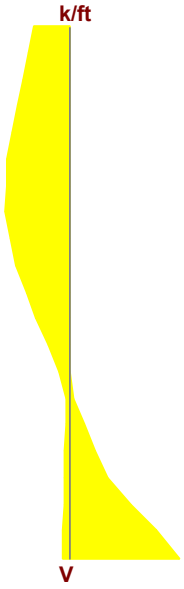
Detail Report: WP15 (Out-of-Plane, Region R1)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

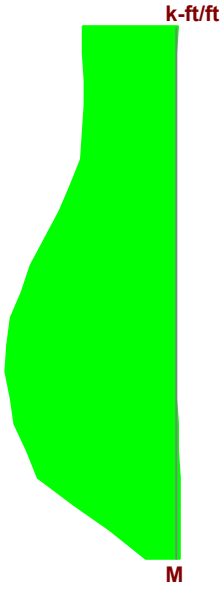
ENVELOPE DIAGRAMS



Min: -11.01 at 0 ft
Max: 5.831 at 0 ft



Min: -0.219 at 0 ft
Max: 0.124 at 7.15 ft



Min: -0.006 at 1.65 ft
Max: 0.28 at 3.85 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.308	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	2	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	-11.01	**UC Max Ext (+z):**	0.308	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z) (k/ft):	-35.785	**Location (ft):**	0	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	-11.01		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	-35.785		

SHEAR DETAILS

UC Max:	0.01	**Gov Vu (k/ft):**	-0.219	**phi*Vns (k/ft):**	21.203
Location (ft):	0	**phi*Vnc (k/ft):**	6.802	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.44
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

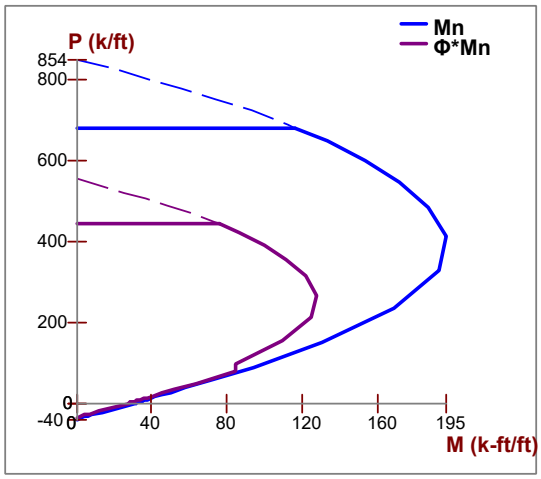
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	22.863
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	126.491		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

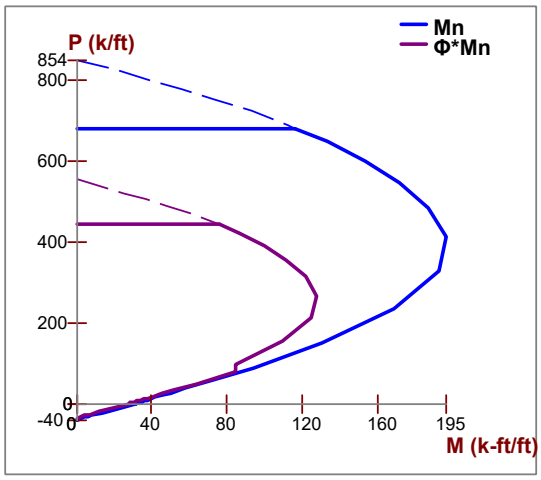
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

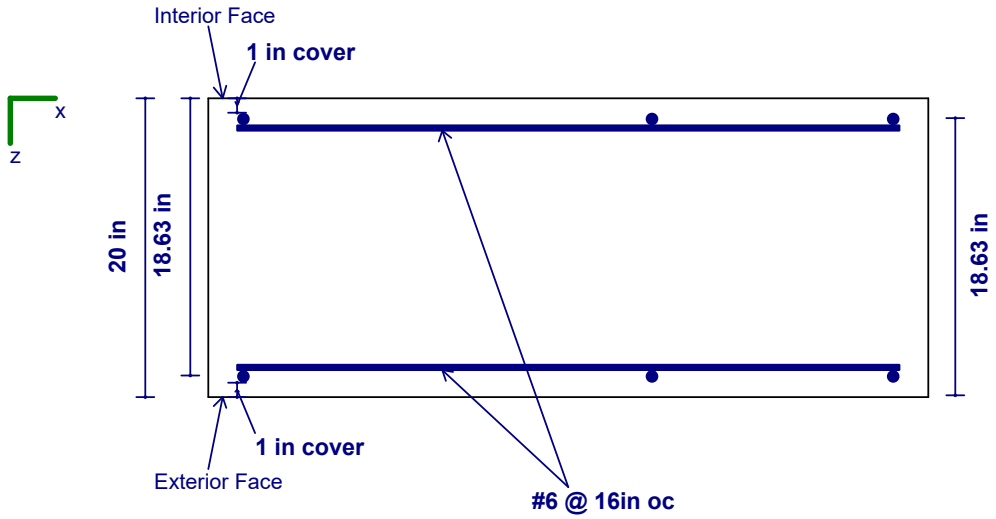
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



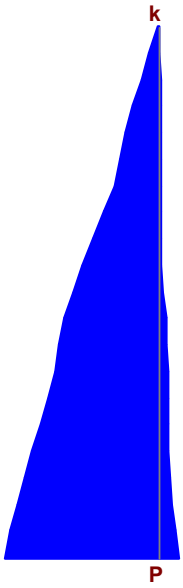
CROSS SECTION DETAILING



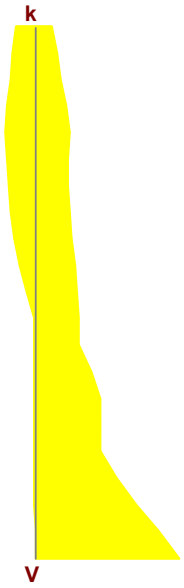
Detail Report: WP15 (In-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

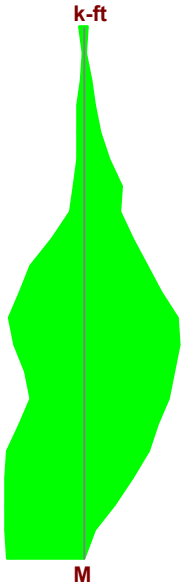
ENVELOPE DIAGRAMS



Min: -1.206 at 0 ft
Max: 9.764 at 0 ft



Min: -2.464 at 0 ft
Max: 0.492 at 6.4 ft



Min: -2.239 at 3.2 ft
Max: 1.852 at 1.2 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.009	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	3.2	**Gov Mu (k-ft):**	-2.239	**Gov LC:**	2
Gov Pu (k):	0	**phi*Mn (k-ft):**	248.939		

SHEAR DETAILS

UC Max:	0.012	**phi*Vn (k):**	210.356	**Vs (k):**	159.043
Location (ft):	0	**Vnmax (k):**	485.726	**Gov LC:**	1
Gov Vu (k):	-2.464	**Vc (k):**	121.431		

DEFLECTION DETAILS

Delta max (in):	0.008	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.069	**rho min (H):**	0.002	**As min (V) (in^2):**	1.44
rho Provided (H):	0.004	**As Provided (V) (in^2):**	2.651	**rho min (V):**	0.002
As min (H) (in^2):	3.84	**rho Provided (V):**	0.003		

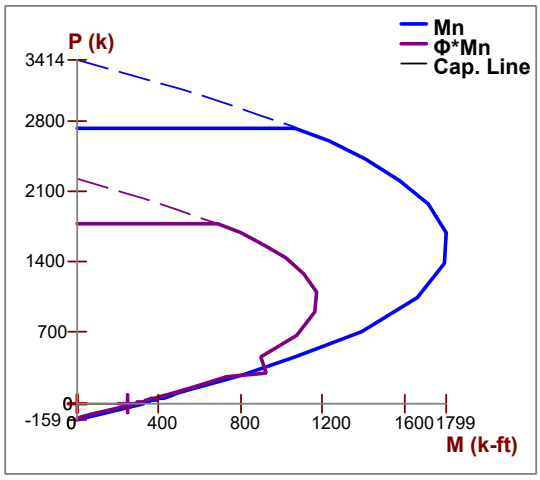
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	4	**Icracked (in^4):**	1.29e+5	**KL/r:**	6.928
A (in^2):	960	**Cracked Mom, Mcr (k-ft):**	303.579		
Igross (in^4):	1.843e+5	**r (in):**	11.593		

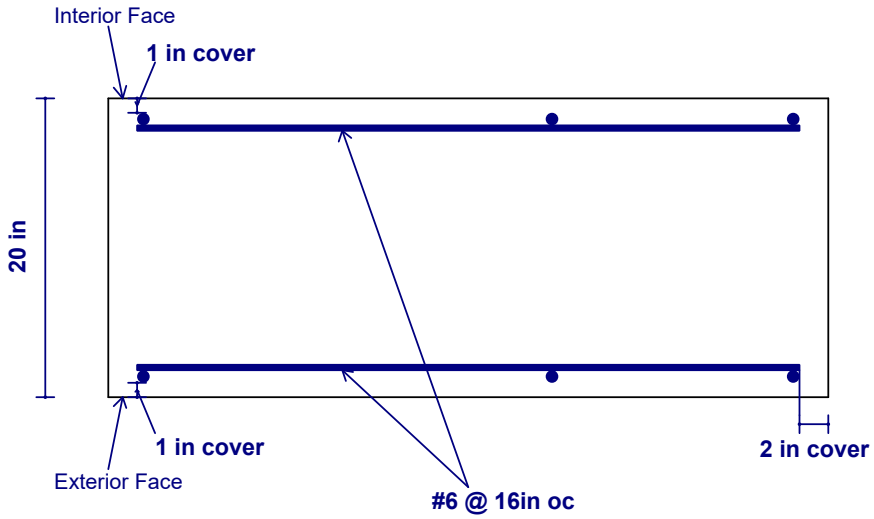
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



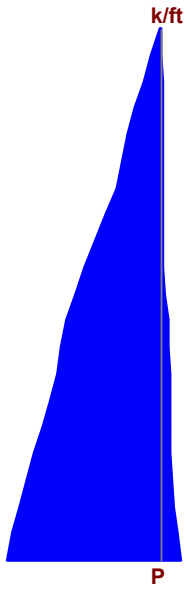
CROSS SECTION DETAILING



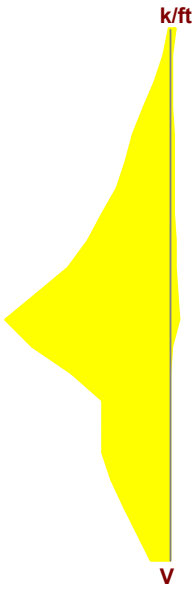
Detail Report: WP15 (Out-of-Plane, Region R4)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	8	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	4	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	20	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

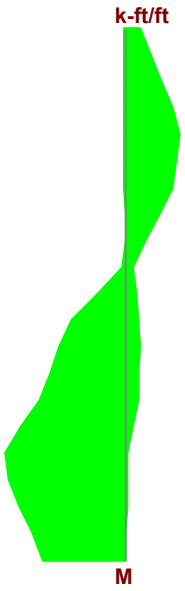
ENVELOPE DIAGRAMS



Min: -0.301 at 0 ft
Max: 2.441 at 0 ft



Min: -0.029 at 3.6 ft
Max: 0.529 at 3.6 ft



Min: -0.22 at 6.4 ft
Max: 0.488 at 1.6 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.008	**phi eff. Int (-z):**	0.9	**Gov Mu Ext (+z) (k-ft/ft):**	0.488
Location (ft):	6.4	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z) (k-ft/ft):**	28.117
Gov Pu Int (-z) (k/ft):	0	**UC Max Ext (+z):**	0.017	**phi eff. Ext (+z):**	0.9
phi*Pn Int (-z):	NC	**Location (ft):**	1.6	**Gov LC Ext (+z):**	2
Gov Mu Int (-z) (k-ft/ft):	-0.22	**Gov Pu Ext (+z) (k/ft):**	0		
phi*Mn Int (-z) (k-ft/ft):	28.117	**phi*Pn Ext (+z):**	NC		

SHEAR DETAILS

UC Max:	0.066	**Gov Vu (k/ft):**	0.529	**phi*Vns (k/ft):**	0
Location (ft):	3.6	**phi*Vnc (k/ft):**	8.07	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.004	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	2.651	**As min (V) (in^2):**	1.44
rho Provided (V):	0.003	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

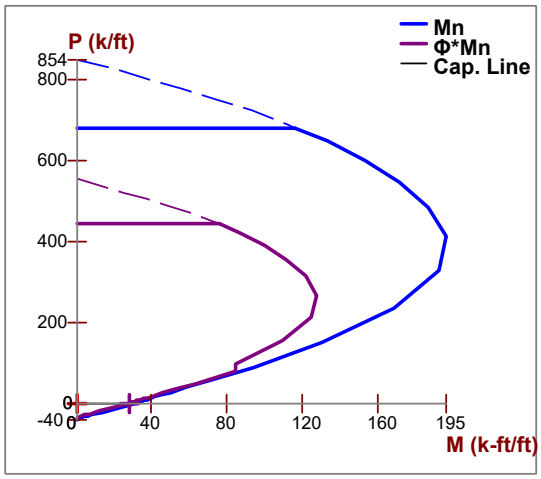
Total Width (in):	16	**Icracked (in^4):**	3733.333	**KL/r:**	16.628
A (in^2):	320	**Cracked Mom, Mcr (k-ft):**	126.491		
Igross (in^4):	10666.667	**r (in):**	3.416		

SLENDER BENDING SPAN RESULTS

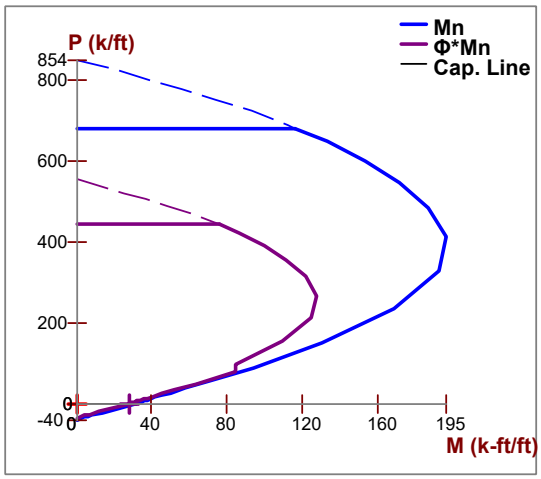
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

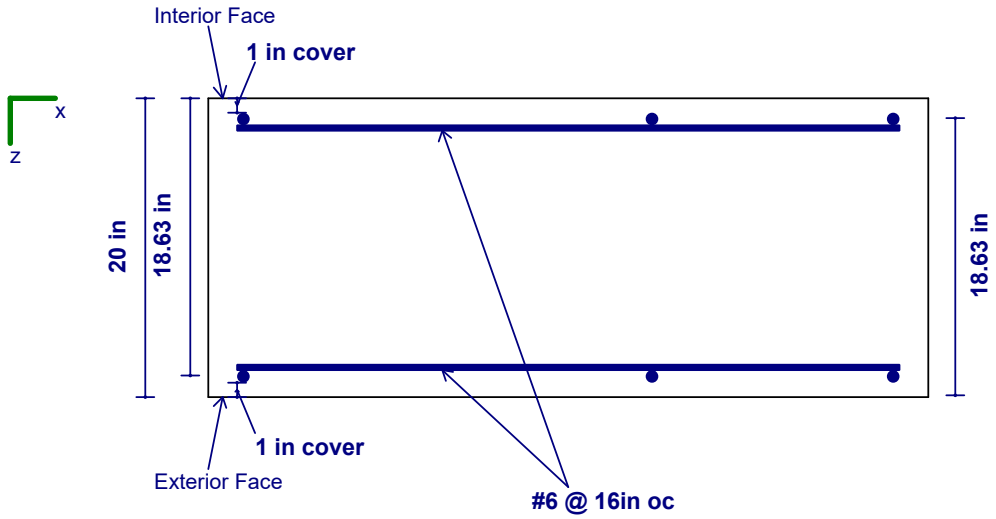
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram

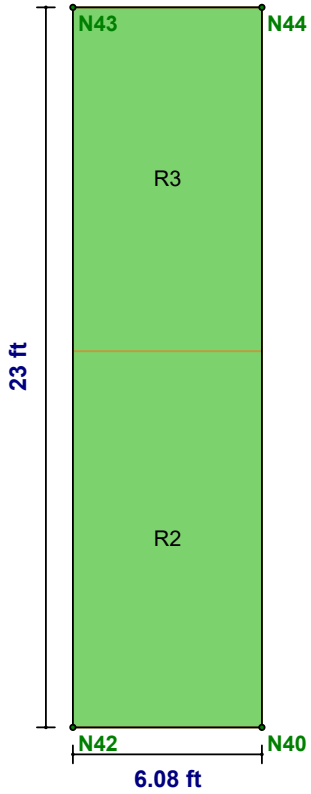


CROSS SECTION DETAILING



Detail Report: WP16

Concrete Wall



CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	23	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.083	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Transfer In?:	No	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Transfer Out?:	No	**In Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No	**Out Icr Factor:**	0.35	**Steel E (ksi):**	29000

REGION RESULTS

Region	UC Max In Plane	LC	UC Shear In Plane	LC	Delta Max In Plane (in)	LC	UC Max Out Plane	LC	UC Shear Out Plane	LC	Delta Max Out Plane (in)	LC
R2	0.039	1	0.069	2	0.004	1	0.036	1	0.023	1	0.007	1
R3	0.033	1	0.066	5	0.006	5	0.026	1	0.002	2	0.005	1

REINFORCEMENT RESULTS

Region	Vertical Reinforcement	Horizontal Reinforcement	Diagonal Reinforcement
R2	#6@16in oc e.f.	#6@16in oc e.f.	N/A
R3	#6@16in oc e.f.	#6@16in oc e.f.	N/A

Detail Report: WP16 (In-Plane, Region R2)

CRITERIA

Code:	ACI 318-19
Design Rule:	Avalanche
Seismic Rule:	SDR_Conc1
Loc of r/f:	Each Face
Outer Bars:	Vertical
Vert Bar Size:	#6
Horz Bar Size:	#6
Vert Bar Spac (in):	16
Horz Bar Spac (in):	16
Group Wall?:	No

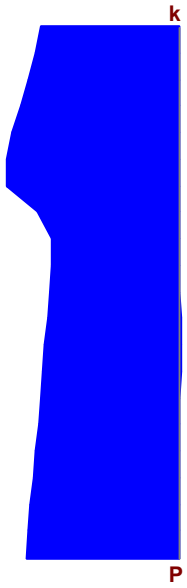
GEOMETRY

Total Height (ft):	12
Total Length (ft):	6.083
Thickness (in):	10
Int Cover (-z) (in):	1
Ext Cover (+z) (in):	1
Cover Open/Edge (in):	2
K:	1
Use Cracked?:	Yes
Icr Factor:	0.7

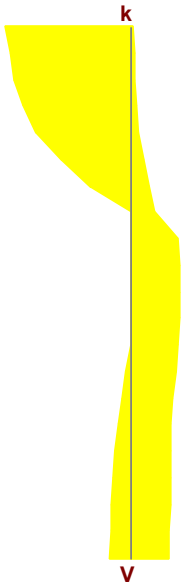
MATERIALS

Material Set:	Conc4000NW
Concrete f'c (ksi):	4
Concrete E (ksi):	3644
Concrete G (ksi):	1584
Conc Density (k/ft^3):	0.145
Lambda:	1
Conc Str Blk:	Rectangular
Vert Bar Fy (ksi):	60
Horz Bar Fy (ksi):	60
Steel E (ksi):	29000

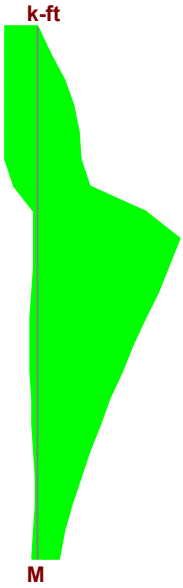
ENVELOPE DIAGRAMS



Min: -0.306 at 4.8 ft
Max: 51.267 at 8.4 ft



Min: -6.946 at 6 ft
Max: 17.375 at 12 ft



Min: -54.664 at 7.2 ft
Max: 11.937 at 10.2 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.039	**phi*Pn (k):**	957.257	**phi eff.:**	0.65
Location (ft):	7.2	**Gov Mu (k-ft):**	-54.664	**Gov LC:**	1
Gov Pu (k):	37.346	**phi*Mn (k-ft):**	1401.16		

SHEAR DETAILS

UC Max:	0.069	**phi*Vn (k):**	252.538	**Vs (k):**	241.865
Location (ft):	12	**Vnmax (k):**	369.334	**Gov LC:**	2
Gov Vu (k):	17.375	**Vc (k):**	94.853		

DEFLECTION DETAILS

Delta max (in):	0.004	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (H) (in^2):	9.719	**rho min (H):**	0.002	**As min (V) (in^2):**	1.095
rho Provided (H):	0.007	**As Provided (V) (in^2):**	4.418	**rho min (V):**	0.002
As min (H) (in^2):	2.88	**rho Provided (V):**	0.006		

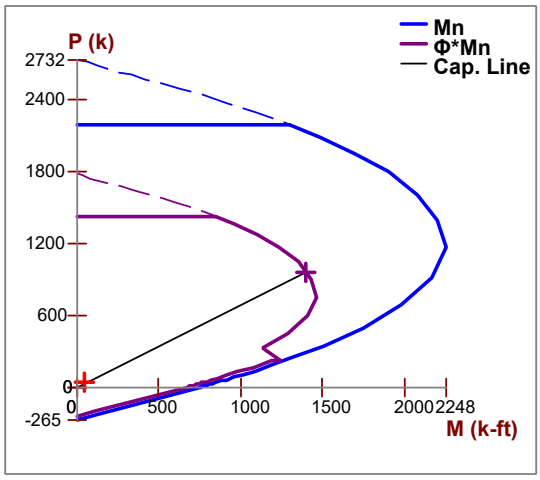
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	6.083	**Icracked (in^4):**	2.269e+5	**KL/r:**	6.834
A (in^2):	729.96	**Cracked Mom, Mcr (k-ft):**	351.04		
Igross (in^4):	3.241e+5	**r (in):**	17.63		

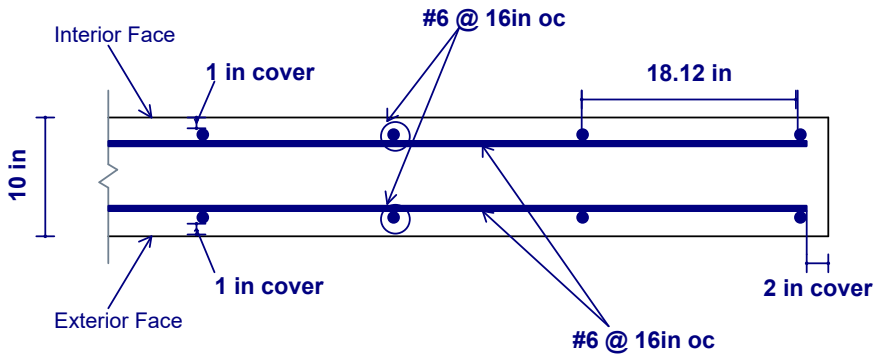
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



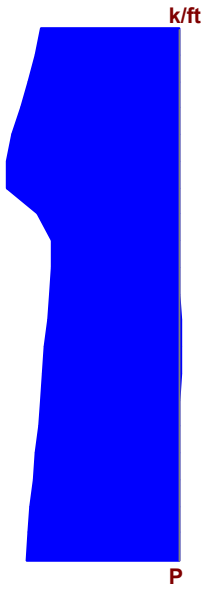
CROSS SECTION DETAILING



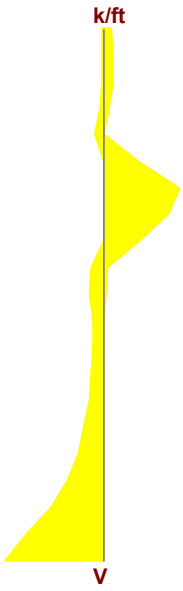
Detail Report: WP16 (Out-of-Plane, Region R2)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	12	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.083	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

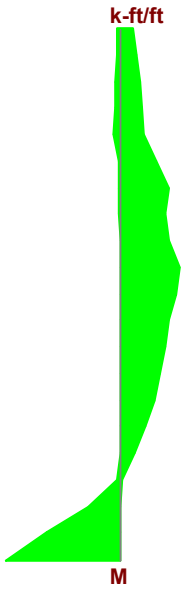
ENVELOPE DIAGRAMS



Min: -0.05 at 4.8 ft
Max: 8.428 at 8.4 ft



Min: -0.121 at 8.4 ft
Max: 0.157 at 0 ft



Min: -0.109 at 6.6 ft
Max: 0.206 at 0 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.036	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	8.4	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	8.428	**UC Max Ext (+z):**	0.036	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	233.535	**Location (ft):**	8.4	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	-0.09	**Gov Pu Ext (+z) (k/ft):**	8.428		
phi*Mn Int (-z) (k-ft/ft):	2.486	**phi*Pn Ext (+z) (k/ft):**	233.535		

SHEAR DETAILS

UC Max:	0.023	**Gov Vu (k/ft):**	0.157	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	6.769	**Gov LC:**	1

DEFLECTION DETAILS

Delta max (in):	0.007	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	4.418	**As min (V) (in^2):**	1.095
rho Provided (V):	0.006	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

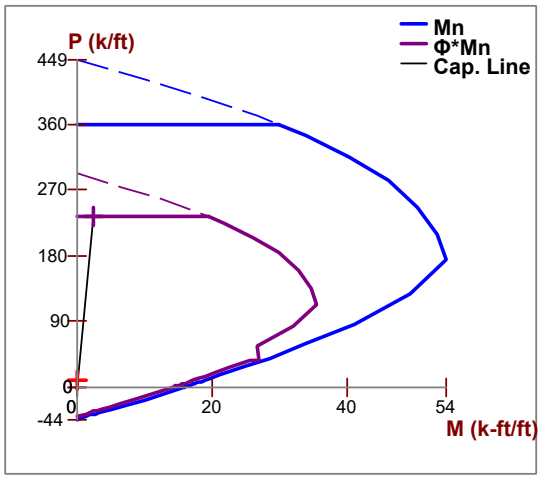
Total Width (in):	16	**Icracked (in^4):**	466.667	**KL/r:**	49.883
A (in^2):	160	**Cracked Mom, Mcr (k-ft):**	48.09		
Igross (in^4):	1333.333	**r (in):**	1.708		

SLENDER BENDING SPAN RESULTS

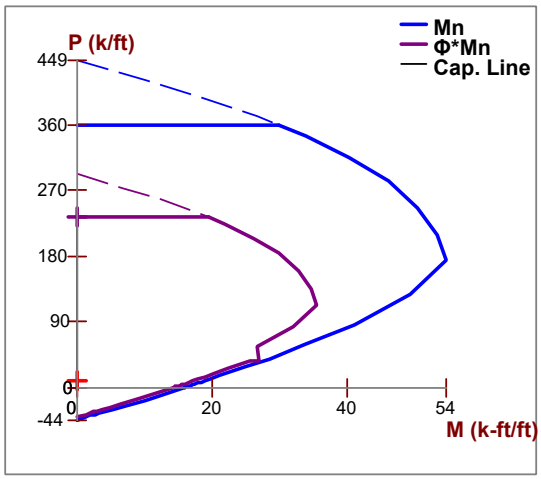
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

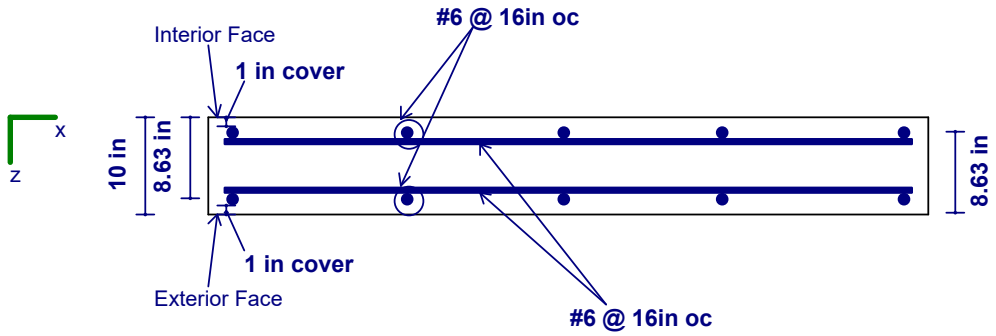
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



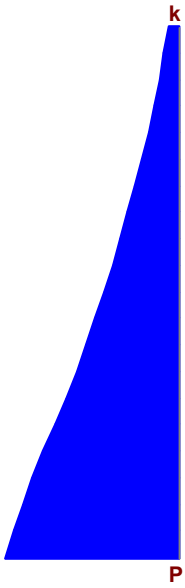
CROSS SECTION DETAILING



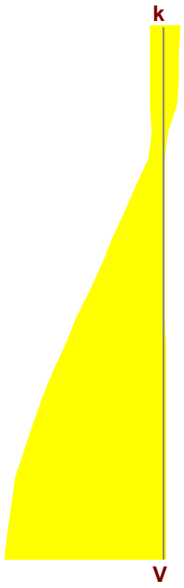
Detail Report: WP16 (In-Plane, Region R3)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.083	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.7	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

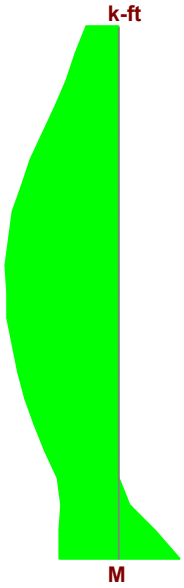
ENVELOPE DIAGRAMS



Min: 1.991 at 11 ft
Max: 36.328 at 0 ft



Min: -1.871 at 11 ft
Max: 17.522 at 0 ft



Min: -12.298 at 0 ft
Max: 22.117 at 6.05 ft

ACI 318-19 Code Check

AXIAL/BENDING DETAILS

UC Max:	0.033	**phi*Pn:**	NC	**phi eff.:**	0.9
Location (ft):	6.05	**Gov Mu (k-ft):**	22.117	**Gov LC:**	1
Gov Pu (k):	0	**phi*Mn (k-ft):**	673.225		

SHEAR DETAILS

UC Max:	0.066	**phi*Vn (k):**	263.923	**Vs (k):**	241.865
Location (ft):	0	**Vnmax (k):**	369.334	**Gov LC:**	5
Gov Vu (k):	17.522	**Vc (k):**	110.032		

DEFLECTION DETAILS

Delta max (in):	0.006	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	5

REINFORCEMENT DETAILS

As Provided (H) (in^2):	7.952	**rho min (H):**	0.002	**As min (V) (in^2):**	1.095
rho Provided (H):	0.006	**As Provided (V) (in^2):**	4.418	**rho min (V):**	0.002
As min (H) (in^2):	2.64	**rho Provided (V):**	0.006		

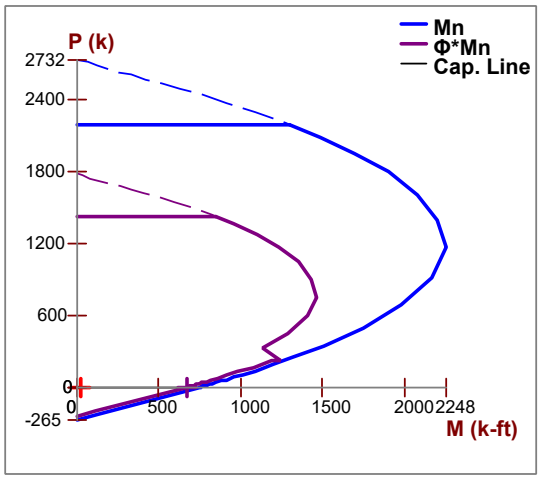
WALL SEGMENT SECTION PROPERTIES

Total Length (ft):	6.083	**Icracked (in^4):**	2.269e+5	**KL/r:**	6.264
A (in^2):	729.96	**Cracked Mom, Mcr (k-ft):**	351.04		
Igross (in^4):	3.241e+5	**r (in):**	17.63		

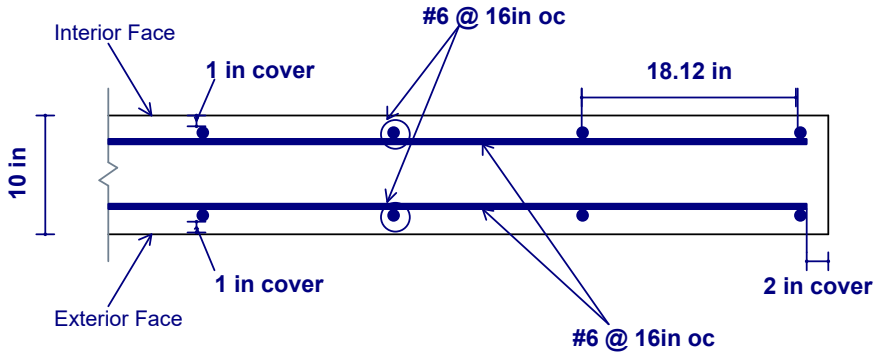
SLENDER BENDING SPAN RESULTS

-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

IN-PLANE WALL INTERACTION DIAGRAM



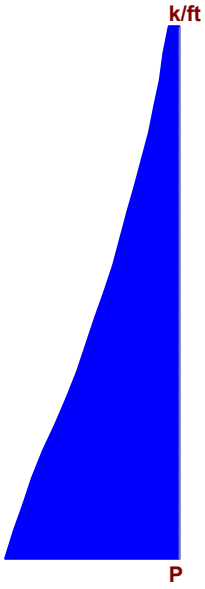
CROSS SECTION DETAILING



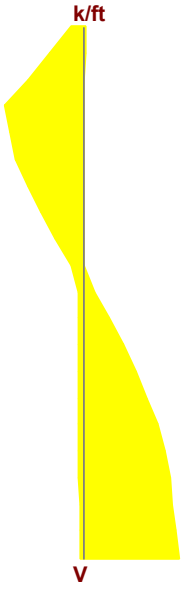
Detail Report: WP16 (Out-of-Plane, Region R3)

CRITERIA		GEOMETRY		MATERIALS	
Code:	ACI 318-19	**Total Height (ft):**	11	**Material Set:**	Conc4000NW
Design Rule:	Avalanche	**Total Length (ft):**	6.083	**Concrete f'c (ksi):**	4
Seismic Rule:	SDR_Conc1	**Thickness (in):**	10	**Concrete E (ksi):**	3644
Loc of r/f:	Each Face	**Int Cover (-z) (in):**	1	**Concrete G (ksi):**	1584
Outer Bars:	Vertical	**Ext Cover (+z) (in):**	1	**Conc Density (k/ft^3):**	0.145
Vert Bar Size:	#6	**Cover Open/Edge (in):**	2	**Lambda:**	1
Horz Bar Size:	#6	**K:**	1	**Conc Str Blk:**	Rectangular
Vert Bar Spac (in):	16	**Use Cracked?:**	Yes	**Vert Bar Fy (ksi):**	60
Horz Bar Spac (in):	16	**Icr Factor:**	0.35	**Horz Bar Fy (ksi):**	60
Group Wall?:	No			**Steel E (ksi):**	29000

ENVELOPE DIAGRAMS



Min: 0.327 at 11 ft
Max: 5.972 at 0 ft



Min: -0.013 at 0.55 ft
Max: 0.011 at 9.35 ft

Min: -0.022 at 0 ft
Max: 0.031 at 5.5 ft

AXIAL/BENDING DETAILS

UC Max Int (-z):	0.026	**phi eff. Int (-z):**	0.65	**Gov Mu Ext (+z) (k-ft/ft):**	0
Location (ft):	0	**Gov LC Int (-z):**	1	**phi*Mn Ext (+z):**	NC
Gov Pu Int (-z) (k/ft):	5.972	**UC Max Ext (+z):**	0.026	**phi eff. Ext (+z):**	0.65
phi*Pn Int (-z) (k/ft):	233.535	**Location (ft):**	0	**Gov LC Ext (+z):**	1
Gov Mu Int (-z) (k-ft/ft):	0	**Gov Pu Ext (+z) (k/ft):**	5.972		
phi*Mn Int (-z):	NC	**phi*Pn Ext (+z) (k/ft):**	233.535		

SHEAR DETAILS

UC Max:	0.002	**Gov Vu (k/ft):**	-0.013	**phi*Vns (k/ft):**	0
Location (ft):	0	**phi*Vnc (k/ft):**	6.389	**Gov LC:**	2

DEFLECTION DETAILS

Delta max (in):	0.005	**Location (ft):**	23
Deflection Ratio:	H/10000	**Gov LC:**	1

REINFORCEMENT DETAILS

As Provided (V) (in^2):	4.418	**As min (V) (in^2):**	1.095
rho Provided (V):	0.006	**rho min (V):**	0.002

WALL SEGMENT SECTION PROPERTIES

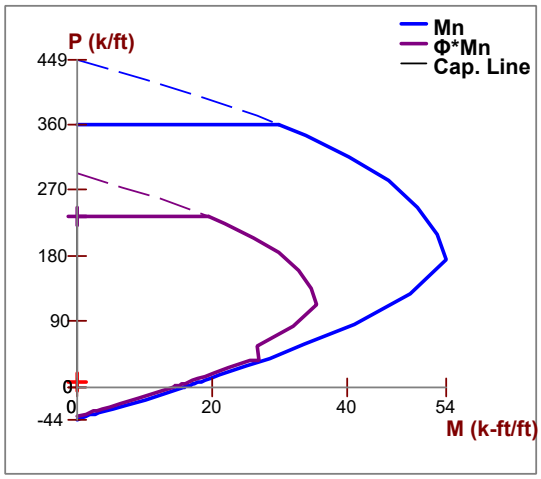
Total Width (in):	16	**Icracked (in^4):**	466.667	**KL/r:**	45.726
A (in^2):	160	**Cracked Mom, Mcr (k-ft):**	48.09		
Igross (in^4):	1333.333	**r (in):**	1.708		

SLENDER BENDING SPAN RESULTS

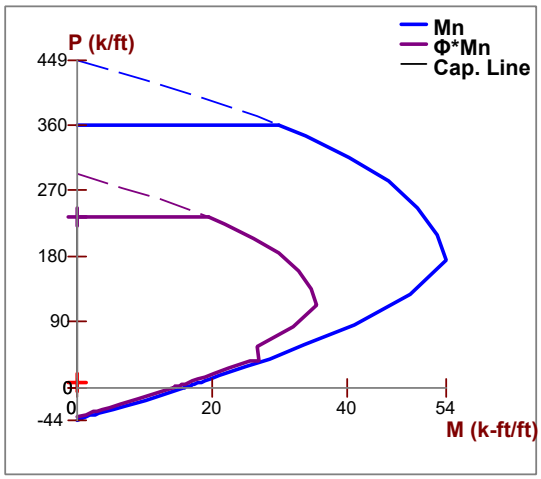
-Slenderness(P - Little Delta) and minimum moment considerations are only done for full - height regions.

OUT-PLANE WALL INTERACTION DIAGRAM

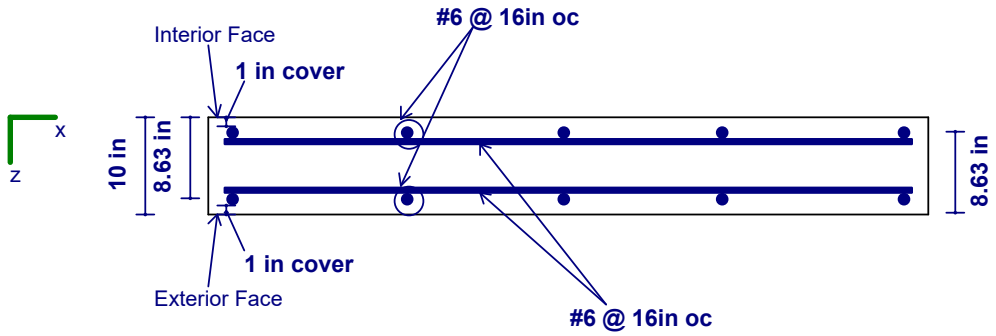
Interior (-z) Face Wall Interaction Diagram



Exterior (+z) Face Wall Interaction Diagram



CROSS SECTION DETAILING



Nodal Loads and Enforced Displacements

No Data to Print...

Member Point Loads

No Data to Print...

Wall Panel Point Loads

No Data to Print...

Diaphragm Point Loads

No Data to Print...

Member Distributed Loads

No Data to Print...

Wall Panel Distributed Loads (BLC 3 : Dead)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP1(36.75ft)	Y	-0.04	-0.04	0	19.566
2	WP12(12ft)	Y	-0.04	-0.04	0	7.104
3	WP3(36.75ft)	Y	-0.04	-0.04	0	7.143
4	WP5(34ft)	Y	-0.04	-0.04	0	6.333
5	WP6(28.75ft)	Y	-0.04	-0.04	0	27.124
6	WP2(36.75ft)	Y	-0.155	-0.155	0	10.038
7	WP4(36.75ft)	Y	-0.225	-0.225	0	21.587
8	WP7(28.75ft)	Y	-0.24	-0.24	0	13.583
9	WP8(23ft)	Y	-0.24	-0.24	0	14.83
10	WP11(12ft)	Y	-0.36	-0.36	0	23.288
11	WP13(12ft)	Y	-0.16	-0.16	0	28.878

Wall Panel Distributed Loads (BLC 4 : Snow)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP1(36.75ft)	Y	-0.2	-0.2	0	19.566
2	WP3(36.75ft)	Y	-0.2	-0.2	0	7.143
3	WP5(34ft)	Y	-0.2	-0.2	0	6.333
4	WP6(28.75ft)	Y	-0.2	-0.2	0	27.124
5	WP2(36.75ft)	Y	-0.775	-0.775	0	10.038
6	WP4(36.75ft)	Y	-1.25	-1.25	0	21.587
7	WP7(28.75ft)	Y	-1.2	-1.2	0	13.583
8	WP8(23ft)	Y	-1.2	-1.2	0	14.83
9	WP11(12ft)	Y	-1.8	-1.8	0	23.288
10	WP12(12ft)	Y	-0.1	-0.1	0	7.104
11	WP13(12ft)	Y	-0.4	-0.4	0	28.878

Diaphragm Distributed Loads

No Data to Print...

Member Area Loads

No Data to Print...

Plate Surface Loads

No Data to Print...

Wall Panel Surface Loads (BLC 1 : Avalanche Load)

	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP15	z	0	0.151	9.2	4.1
2	WP15	z	0.151	0.151	4	5.2
3	WP10	z	0	0.194	9	5.2
4	WP10	z	0.194	0.194	4	5
5	WP9	z	0	0.273	9.2	7.4
6	WP9	z	0.273	0.273	4	5.2
7	WP8	z	0	0.363	9.3	9.75
8	WP8	z	0.363	0.363	4	5.3
9	WP7	z	0	0.434	9.5	11.6
10	WP7	z	0.434	0.434	4	5.5
11	WP6	z	0.276	0.276	4	6.2
12	WP6	z	0	0.276	10.2	7.4
13	WP5	z	0	0.573	22	15.3
14	WP5	z	0.573	0.573	12	10
15	WP4	z	0	0.72	21.3	19.2
16	WP4	z	0.72	0.72	12	9.3
17	WP3	z	0	0.424	20.6	11.3
18	WP3	z	0.424	0.424	12	8.6
19	WP2	z	0	0.582	20.15	15.5
20	WP2	z	0.582	0.582	12	8.15
21	WP1	z	0	-0.143	18.4	3.8
22	WP1	z	-0.143	-0.143	12	6.4

Wall Panel Surface Loads (BLC 2 : Retaining)

	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP13	z	0	0.66	0	12
2	WP12	z	0	-0.66	0	12
3	WP11	z	0	-0.66	0	12
4	WP1	z	0	-0.66	0	12
5	WP2	z	0	0.66	0	12
6	WP3	z	0	0.66	0	12
7	WP4	z	0	0.66	0	12
8	WP5	z	0	0.66	0	12
9	WP6	z	0	0.22	0	4
10	WP7	z	0	0.22	0	4
11	WP8	z	0	0.22	0	4
12	WP10	z	0	0.22	0	4
13	WP9	z	0	0.22	0	4

Diaphragm Surface Loads

No Data to Print...

Basic Load Cases

	BLC Description	Category	Y Gravity	Distributed	Surface(Plate/Wall)
1	Avalanche Load	IL			22
2	Retaining	EPL			13
3	Dead	DL	-1	11	
4	Snow	SL		11	

Moving Loads

No Data to Print...

Moving Load Patterns

No Data to Print...

Time History Loads

No Data to Print...

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Combine	Yes	Y	1	1	2	1	3	1	4	1		
2	Avalanche + Retaining	Yes	Y	1	1	2	1						
3	DL	Yes	Y	3	1								
4	SL	Yes	Y	4	1								
5	AVY	Yes	Y	1	1								
6	Retaining	Yes	Y	2	1								
7	Deflection 1	Yes	Y	DL	1								
8	Deflection 2	Yes	Y	LL	1								
9	Deflection 3	Yes	Y	DL	1	LL	1						
10	IBC 16-1	Yes	Y	DL	1.4								
11	IBC 16-2 (a)	Yes	Y	DL	1.2	LL	1.6	LLS	1.6				
12	IBC 16-2 (b)	Yes	Y	DL	1.2	LL	1.6	LLS	1.6	SL	0.5	SLN	0.5
13	IBC 16-3 (c)	Yes	Y	DL	1.2	SL	1.6	SLN	1.6	LL	0.5	LLS	1

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	Combine		Yes	Yes		Yes	Yes	Yes	Yes	Yes
2	Avalanche + Retaining		Yes	Yes		Yes	Yes	Yes	Yes	Yes
3	DL		Yes	Yes		Yes	Yes	Yes	Yes	Yes
4	SL		Yes	Yes		Yes	Yes	Yes	Yes	Yes
5	AVY		Yes	Yes		Yes	Yes	Yes	Yes	Yes
6	Retaining		Yes	Yes		Yes	Yes	Yes	Yes	Yes
7	Deflection 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Deflection 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Deflection 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	IBC 16-1		Yes	Yes		Yes	Yes	Yes	Yes	Yes
11	IBC 16-2 (a)		Yes	Yes		Yes	Yes	Yes	Yes	Yes
12	IBC 16-2 (b)		Yes	Yes		Yes	Yes	Yes	Yes	Yes
13	IBC 16-3 (c)		Yes	Yes		Yes	Yes	Yes	Yes	Yes

Design Size and Code Check Parameters

	Label	Max Axial/Bending Chk	Max Shear Chk
1	Typical	1	1

Concrete Rebar Parameters

	Label	Optimize Rebar ?	Min Flex Bar	Max Flex Bar	Shear Bar	Legs per Stirrup	Top (Column) Cover [in]	Bottom Cover [in]	Side Cover [in]	Top/Bottom Bars	Add'l Side Bars	Shear Bar Spacing [in]
1	Typical	Optimize	#6	#10	#4	2	1.5	1.5	1.5	2	1	12

Deflection Design

	Label	LC	Ratio	LC	Ratio	LC	Ratio
1	Typical	1	240	2	360	3	240

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	Typical	1	1
2	Avalanche	1	1
3	Garage Retaining	1	1
4	Test1	1	1
5	R5	1	1

Masonry Wall Panel Parameters

	Label	Block Nom Width	Block Grouting	Reinforced	Wall Area Method
1	Typical	10"	Partially Grouted	Yes	NCMA
2	Avalanche	8"	Partially Grouted	Yes	NCMA
3	Garage Retaining	8"	Partially Grouted	Yes	NCMA
4	Test1	8"	Partially Grouted	Yes	NCMA
5	R5	8"	Partially Grouted	Yes	NCMA

Masonry Wall Panel In-Plane Parameters

	Label	Vert Bar Size	Bars Per Cell	Min Bound Zone Width [in]	Max Bound Zone Width [in]	Horz Bar Size	Transfer Load
1	Typical	#5	1	8	40	#5	
2	Avalanche	#5	1	8	40	#5	
3	Garage Retaining	#5	1	8	40	#5	
4	Test1	#5	1	8	40	#5	
5	R5	#5	1	8	40	#5	

Masonry Wall Panel Out-of-Plane Parameters

	Label	Bar Size	Bar Space Min	Bar Space Max	Bar Placement	Cover [in]	Mortar Type	Cement Type	Transfer Load
1	Typical	#5	8"	72"	Center	Min	Type M or S	Portland, Lime/Mortar	
2	Avalanche	#5	8"	72"	Center	Min	Type M or S	Portland, Lime/Mortar	
3	Garage Retaining	#5	8"	72"	Center	Min	Type M or S	Portland, Lime/Mortar	
4	Test1	#5	8"	72"	Center	Min	Type M or S	Portland, Lime/Mortar	
5	R5	#5	8"	72"	Center	Min	Type M or S	Portland, Lime/Mortar	

Masonry Wall Panel Lintel Parameters

	Label	Depth [in]	Bear Length [in]	Bar Size	Min # Bars Per Layer	Max # Bars Per Layer	Num of Layers	c/c Sp of Layers [in]	Dist To Bot [in]	Stirrup Size	Analysis Method
1	Typical	16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported
2	Avalanche	16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported
3	Garage Retaining	16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported
4	Test1	16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported
5	R5	16	8	#5	1	3	1	N/A	3.5	#4	Simply Supported

Wood Wall Panel Parameters

	Label	Top Plate	Sill Plate	Studs	Min Stud Space [in]	Max Stud Space [in]	Green Lumber?	Header Size	Header Matl
1	Typical	2-2X8	2X6	2X6	16	16		6x8	Same as Wall
2	Avalanche	2-2X6	2X6	2X6	16	16		6X8	Same as Wall

Wood Wall Panel Parameters (Continued)

	Label	Top Plate	Sill Plate	Studs	Min Stud Space [in]	Max Stud Space [in]	Green Lumber?	Header Size	Header Matl
3	Garage Retaining	2-2X6	2X6	2X6	16	16		6X8	Same as Wall
4	Test1	2-2X6	2X6	2X6	16	16		6X8	Same as Wall
5	R5	2-2X6	2X6	2X6	16	16		6X8	Same as Wall

Additional Wood Wall Panel Parameters

	Label	Schedule	Min Panel Thick [in]	Max Panel Thick [in]	Double Sided Panel?	Max. Nail Spacing	Min. Nail Spacing	HD Chords	HD Chord Matl	Hold Down	Chord Strap	Eccentricity
1	Typical	AWC 2015 OSB	0.375	0.75	Optimum	6-in.	2-in.	2-2X8	Same as Wall	SIMPSON HoldDowns	SIMPSON Chord Straps	
2	Avalanche	AWC 2015 OSB	0.375	0.469	Optimum	6-in.	3-in.	2-2X6	Same as Wall	CAN SIMPSON Catalog	SIMPSON Chord Straps	
3	Garage Retaining	AWC 2015 OSB	0.375	0.469	Optimum	6-in.	3-in.	2-2X6	Same as Wall	CAN SIMPSON Catalog	SIMPSON Chord Straps	
4	Test1	AWC 2015 OSB	0.375	0.469	Optimum	6-in.	3-in.	2-2X6	Same as Wall	CAN SIMPSON Catalog	SIMPSON Chord Straps	
5	R5	AWC 2015 OSB	0.375	0.469	Optimum	6-in.	3-in.	2-2X6	Same as Wall	CAN SIMPSON Catalog	SIMPSON Chord Straps	

Concrete Wall Panel Rebar Parameters

	Label	Vert Bar Size	Max Vert Bar Space [in]	Min Vert Bar Space [in]	Vert Bar Inc [in]	Horz Bar Size	Max Horz Bar Space [in]	Min Horz Bar Space [in]	Horz Bar Inc [in]	Group Wall
1	Typical	#6	18	4	2	#4	18	4	2	
2	Avalanche	#6	16	8	2	#6	16	8	2	
3	Garage Retaining	#5	12	4	2	#5	12	4	2	
4	Test1	#4	18	4	2	#4	18	4	2	
5	R5	#6	16	4	2	#5	16	4	2	

Concrete Wall Panel Cover Parameters

	Label	Outer Bars	Location	Int Cover -z [in]	Ext Cover +z [in]	Edge Cover [in]	Transfer In	Transfer Out
1	Typical	Vertical	Each Face	1	1	2		
2	Avalanche	Vertical	Each Face	1	1	2		
3	Garage Retaining	Vertical	Centered	NA	NA	2		
4	Test1	Vertical	Each Face	1	1	2		
5	R5	Vertical	Each Face	1	1	2		

Frame / HR Seismic Design Rule

	Label	Frame Type	Column Ductility	Column Overstrength	Beam Ductility	Connection	Beam Overstrength	Z Factor	Hinge Location [in]	Brace Ductility	Brace Overstrength	KL/r
1	OCBF	OCBF	Minimal	Yes	Minimal	Other/None		N/A	N/A	Minimal		
2	SCBF	SCBF	High	Yes	High	Other/None	Yes	N/A	N/A	High		Yes
3	OMF	OMF	Minimal	Yes	Minimal	BUEEP			12	N/A		
4	IMF	IMF	Moderate	Yes	Moderate	BFP			12	N/A		
5	SMF-RBS	SMF	High	Yes	High	RBS		0.685	14.625	N/A		
6	SMF-KaiserB	SMF	High	Yes	High	KBB-B			12	N/A		
7	SMF-KaiserW	SMF	High	Yes	High	KBB-W			12	N/A		
8	SMF-BSEEP	SMF	High	Yes	High	BSEEP			12	N/A		
9	SMF-WUF-W	SMF	High	Yes	High	WUF-W				N/A		

Concrete Wall Seismic Design Rule

	Label	Wall Type	Diagonal Bar Size
1	SDR_Conc1	Ordinary	N/A

Masonry Wall Seismic Design Rule

No Data to Print...

Connection Design Rules

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
1	Col/Bm Single Angle Shear	Shear	Column/Beam Clip Single Angle Shear	Bolted	Bolted	1.5
2	Col/Bm Double Angle Shear	Shear	Column/Beam Clip Double Angle Shear	Bolted	Bolted	0
3	Col/Bm Two Side Clip Angle Shear	Shear	Column/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
4	Col/Bm End Plate Shear	Shear	Column/Beam End-Plate Shear	N/A	Bolted	N/A
5	Col/Bm Shear Tab Shear	Shear	Column/Beam Shear Tab Shear	Bolted	N/A	0
6	Girder/Bm Single Angle Shear	Shear	Girder/Beam Clip Single Angle Shear	Bolted	Bolted	N/A
7	Girder/Bm Double Angle Shear	Shear	Girder/Beam Clip Double Angle Shear	Bolted	Bolted	N/A
8	Grd/Bm Two Side Clip Angle Shear	Shear	Girder/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
9	Girder/Bm End Plate Shear	Shear	Girder/Beam End-Plate Shear	N/A	Bolted	N/A
10	Girder/Bm Shear Tab Shear	Shear	Girder/Beam Shear Tab Shear	Bolted	N/A	N/A
11	Beam Shear Splice	Shear	Beam Shear Tab Splice	Bolted	N/A	N/A
12	Column Shear Splice	Shear	Column Shear Tab Splice	N/A	Bolted	N/A
13	Col/Bm Ext. End Plate Moment	Moment	Column/Beam Extended End-Plate Moment	N/A	N/A	N/A
14	Col/Bm PartExt. End Plate Moment	Moment	Column/Beam Partially Extended End-Plate Moment (Tension side)	N/A	N/A	N/A
15	Col/Bm Flush End Plate Moment	Moment	Column/Beam Flush End-Plate Moment	N/A	N/A	N/A
16	Col/Bm Flange Plate Moment	Moment	Column/Beam Flange Plate Moment	Bolted	N/A	N/A
17	Col/Bm Direct Weld Moment	Moment	Column/Beam Direct Weld Moment	Bolted	N/A	N/A
18	Col/Bm Seismic Moment	Moment	Column/Beam Seismic Moment	N/A	N/A	N/A
19	Beam Moment Plate Splice	Moment	Beam Moment Plate Splice	Bolted	N/A	N/A
20	Column Moment Plate Splice	Moment	Column Moment Plate Splice	N/A	N/A	N/A
21	Beam Direct Weld Moment Splice	Moment	Beam Direct Weld Splice	Bolted	N/A	N/A
22	Col Direct Weld Moment Splice	Moment	Column Direct Weld Splice	N/A	Bolted	N/A
23	Bm Ext. End Plate Moment Splice	Moment	Beam Extended End Plate Splice	Bolted	N/A	N/A
24	Col Ext. End Plate Moment Splice	Moment	Column Extended End Plate Splice	N/A	Bolted	N/A
25	Diagonal Vertical Brace	Brace	Diagonal Vertical Brace	N/A	N/A	N/A
26	Chevron Vertical Brace	Brace	Chevron Vertical Brace	N/A	N/A	N/A
27	Seismic Diagonal Brace	Brace	Diagonal Brace Seismic	N/A	N/A	N/A
28	Seismic Chevron Brace	Brace	Chevron Brace Seismic	N/A	N/A	N/A
29	Knee Brace	Brace	Knee Brace	N/A	N/A	N/A
30	Single Column Base Plate	Baseplate	Single Column Baseplate	N/A	N/A	N/A
31	Base Plate with Vertical Brace	Baseplate	Brace to Column Base Plate	N/A	N/A	N/A
32	HSS Truss Connection	Truss	HSS T-Connection	N/A	N/A	N/A

Drift Definitions

	Type	Floor/Diaphragm	Node Label	Elevation [ft]
1	Diaphragm	Diaph.: 1	-	12
2	Diaphragm	Diaph.: 2	-	0

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	7.104	0	89.708	
2	N2	26.67	0	89.708	
3	N3	26.67	0	79.67	
4	N4	33.8125	0	79.67	
5	N5	33.8125	0	58.083	
6	N6	7.104	36.75	89.708	
7	N7	26.67	36.75	89.708	
8	N8	26.67	36.75	79.67	
9	N9	33.8125	36.75	79.67	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
10	N10	33.8125	36.75	58.083	
11	N11	40.146	8	58.083	
12	N12	40.146	34	58.083	
13	N13	40.146	36.75	58.083	
14	N14	33.8125	34	58.083	
15	N15	67.27	8	58.083	
16	N16	67.27	36.75	58.083	
17	N17	67.27	8	44.5	
18	N18	67.27	36.75	44.5	
19	N19	67.27	31	44.5	
20	N20	67.27	8	29.67	
21	N22	74.604	8	29.67	
22	N23	74.604	31	29.67	
23	N24	67.27	31	29.67	
24	N25	70.604	8	29.67	
25	N26	70.604	26	29.67	
26	N27	70.604	8	18.5	
27	N28	70.604	26	18.5	
28	N29	7.104	12	89.708	
29	N30	7.104	0	66.42	
30	N31	7.104	12	66.42	
31	N32	0	0	66.42	
32	N33	0	12	66.42	
33	N34	0	0	37.542	
34	N35	0	12	37.542	
35	N36	26.67	0	61.542	
36	N37	26.67	36	61.542	
37	N38	33.8125	0	61.542	
38	N39	33.8125	36	61.542	
39	N40	40.146	0	58.083	
40	N41	70.604	31	29.67	
41	N42	40.146	0	52	
42	N43	40.146	23	52	
43	N44	40.146	23	58.083	
44	N44A	26.67	12	89.708	
45	N45	26.67	12	79.67	
46	N46	33.8125	12	79.67	
47	N47	33.8125	12	58.083	
48	N48	40.146	12	58.083	
49	N49	67.27	12	58.083	
50	N50	67.27	12	44.5	
51	N51	67.27	12	29.67	
52	N52	70.604	12	29.67	
53	N53	70.604	12	18.5	
54	N54	33.8125	12	61.542	
55	N55	26.67	12	61.542	
56	N56	74.604	12	29.67	
57	N57	40.146	12	52	

Node Boundary Conditions

No Data to Print...

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B RECT	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.4	62	1.3
7	A500 Gr.C RECT	29000	11154	0.3	0.65	0.527	50	1.4	62	1.3
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
10	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Fu [ksi]
1	A653 SS Gr33	29500	11346	0.3	0.65	0.49	33	45
2	A653 SS Gr50/1	29500	11346	0.3	0.65	0.49	50	65

Wood Properties

	Label	Type	Database	Species	Grade	Cm	Ci	Emod	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]
1	DF	Solid Sawn	Visually Graded	Douglas Fir-Larch	No.1			1	0.3	0.3	0.035
2	SP	Solid Sawn	Visually Graded	Southern Pine	No.1			1	0.3	0.3	0.035
3	HF	Solid Sawn	Visually Graded	Hem-Fir	No.1			1	0.3	0.3	0.035
4	SPF	Solid Sawn	Visually Graded	Spruce-Pine-fir	No.1			1	0.3	0.3	0.035
5	24F-1.8E DF Balanced	Glulam	NDS Table 5A	24F-1.8E_DF_BAL	na			1	0.3	0.3	0.035
6	24F-1.8E DF Unbalanced	Glulam	NDS Table 5A	24F-1.8E_DF_UNBAL	na			1	0.3	0.3	0.035
7	24F-1.8E SP Balanced	Glulam	NDS Table 5A	24F-1.8E_SP_BAL	na			1	0.3	0.3	0.035
8	24F-1.8E SP Unbalanced	Glulam	NDS Table 5A	24F-1.8E_SP_UNBAL	na			1	0.3	0.3	0.035
9	1.3E-1600F_VERSALAM	SCL	Boise Cascade	1.3E-1600F_VERSALAM	na			1	0.3	0.3	0.035
10	1.35E LSL_SolidStart	SCL	Louisiana Pacific	1.35E LSL_SolidStart	na			1	0.3	0.3	0.035
11	1.3E_RIGIDLAM LVL	SCL	Roseburg Forest Products	1.3E_RIGIDLAM LVL	na			1	0.3	0.3	0.035
12	2.0E_DF Parallam PSL	SCL	TrusJoist	2.0E_DF Parallam PSL	na			1	0.3	0.3	0.035
13	LVL_PRL_1.5E_2250F	Custom	N/A	LVL_PRL_1.5E_2250F	na			1	0.3	0.3	0.035
14	LVL_Microlam_1.9E_2600F	Custom	N/A	LVL_Microllam_1.9E_2600F	na			1	0.3	0.3	0.035
15	PSL_Parallam_2.0E_2900F	Custom	N/A	PSL_Parallam_2.0E_2900F	na			1	0.3	0.3	0.035
16	LSL_TimberStrand_1.55E_2325F	Custom	N/A	LSL_TimberStrand_1.55E_2325F	na			1	0.3	0.3	0.035

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	f'c [ksi]	Lambda	Flex Steel [ksi]	Shear Steel [ksi]
1	Conc3000NW	3156	1372	0.15	0.6	0.145	3	1	60	60
2	Conc3500NW	3409	1482	0.15	0.6	0.145	3.5	1	60	60
3	Conc4000NW	3644	1584	0.15	0.6	0.145	4	1	60	60
4	Conc3000LW	2085	907	0.15	0.6	0.11	3	0.75	60	60
5	Conc3500LW	2252	979	0.15	0.6	0.11	3.5	0.75	60	60
6	Conc4000LW	2408	1047	0.15	0.6	0.11	4	0.75	60	60
7	CONC5000NW	4030	1752	0.15	0.6	0.145	5	1	60	60

Masonry Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Self Weight [k/ft³]	f'm [ksi]	Flex Steel [ksi]	Shear Steel [ksi]
1	Concrete Matl	1350	540	0.25	0.6	Custom	1.5	60	60
2	Clay Matl	1050	420	0.25	0.6	Custom	1.5	60	60

Masonry Properties (Continued)

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Self Weight [k/ft³]	f'm [ksi]	Flex Steel [ksi]	Shear Steel [ksi]
3	Gen Masonry	1050	420	0.25	0.6	0.08	1.5	60	60

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Table B.4	kt	Ftu [ksi]	Fty [ksi]	Fcy [ksi]	Fsu [ksi]	Ct
1	3003-H14	10100	3787.5	0.33	1.3	0.173	Table B.4-1	1	19	16	13	12	141
2	6061-T6	10100	3787.5	0.33	1.3	0.173	Table B.4-2	1	38	35	35	24	141
3	6063-T5	10100	3787.5	0.33	1.3	0.173	Table B.4-2	1	22	16	16	13	141
4	6063-T6	10100	3787.5	0.33	1.3	0.173	Table B.4-2	1	30	25	25	19	141
5	5052-H34	10200	3787.5	0.33	1.3	0.173	Table B.4-1	1	34	26	24	20	141
6	6061-T6 W	10100	3787.5	0.33	1.3	0.173	Table B.4-1	1	24	15	15	15	141

Stainless Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	n	Yield [ksi]	Fu [ksi]
1	A276 S316	28000	10780	0.3	0.93	0.5	5.6	30	75
2	A276 S321	29000	11165	0.3	0.73	0.48	5.6	65	94
3	A276 S304	28000	10780	0.3	0.93	0.49	5.6	30	75

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Plate Methodology
1	gen_Conc3NW	3155	1372	0.15	0.6	0.145	Isotropic
2	gen_Conc4NW	3644	1584	0.15	0.6	0.145	Isotropic
3	gen_Conc3LW	2085	906	0.15	0.6	0.11	Isotropic
4	gen_Conc4LW	2408	1047	0.15	0.6	0.11	Isotropic
5	gen_Alum	10100	4077	0.3	1.29	0.173	Isotropic
6	gen_Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	gen_Plywood	1800	38	0	0.3	0.035	Isotropic
8	RIGID	1e+6		0.3	0	0	Isotropic
9	gen_Ortho	N/A	N/A	N/A	0.65	0.49	Orthotropic

Custom Wood Properties

	Label	Fb	Ft	Fv	Fc	E	E05	Type
1	LVL_PRL_1.5E_2250F	2.25	1.5	0.22	1.95	1500	0.5	SCL
2	LVL_PRL_2.0E_2900F	2.9	1.9	0.285	2.75	2000	0.5	SCL
3	LVL_Microllam_1.9E_2600F	2.6	1.555	0.285	2.51	1900	0.5	SCL
4	PSL_Parallam_2.0E_2900F	2.9	2.025	0.29	2.9	2000	0.5	SCL
5	PSL_Parallam_1.8E	2.4	1.755	0.18	2.5	1800	0.5	SCL
6	LSL_TimberStrand_1.55E_2325F	2.325	1.07	0.31	2.05	1550	0.5	SCL
7	LSL_TimberStrand_1.3E_1700F	1.7	1.075	0.4	1.4	1300	0.5	SCL

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	HR1	W10X33	Beam	Wide Flange	A992	Typical	9.71	36.6	171	0.583

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	CF1	8CU1.25X057	Beam	CU	A653 SS Gr33	Typical	0.581	0.057	4.41	0.00063

Wood Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	WOOD1	2X6	Beam	Rectangular Double	DF	Typical	8.25	1.547	20.797	5.125

Concrete Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	CONC1	CRECT12X8	Beam	Rectangular	Conc3000NW	Typical	96	512	1152	1187.84

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	AL1	AAI3X1.64	Beam	None	3003-H14	Typical	1.39	0.522	2.24	0.019

Stainless Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	SS1	W10X33_SS	Beam	None	A276 S316	Typical	9.71	36.6	171	0.583

General Section Sets

	Label	Shape	Type	Material	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	GEN1	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Member Primary Data

No Data to Print...

Member Advanced Data

No Data to Print...

Hot Rolled Steel Design Parameters

No Data to Print...

Cold Formed Steel Design Parameters

No Data to Print...

Wood Design Parameters

No Data to Print...

Concrete Beam Design Parameters

No Data to Print...

Concrete Column Design Parameters

No Data to Print...

Aluminum Design Parameters

No Data to Print...

Stainless Steel Design Parameters

No Data to Print...

Member RISAConnection Properties

No Data to Print...

Plate Primary Data

No Data to Print...

Plate Advanced Data

No Data to Print...

Solid Primary Data

No Data to Print...

Wall Panel Data

	Label	A Node	B Node	C Node	D Node	Material Type	Material Set	Thickness [in]	Design Rule	Panel/Spacing
1	WP1	N7	N2	N1	N6	Concrete	Conc4000NW	20	Avalanche	N/A
2	WP2	N7	N2	N3	N8	Concrete	Conc4000NW	20	Avalanche	N/A
3	WP3	N8	N3	N4	N9	Concrete	Conc4000NW	20	Avalanche	N/A
4	WP4	N9	N4	N5	N10	Concrete	Conc4000NW	20	Avalanche	N/A
5	WP6	N13	N11	N15	N16	Concrete	Conc4000NW	20	Avalanche	N/A
6	WP7	N16	N15	N17	N18	Concrete	Conc4000NW	20	Avalanche	N/A
7	WP8	N19	N17	N20	N24	Concrete	Conc4000NW	20	Avalanche	N/A
8	WP10	N26	N25	N27	N28	Concrete	Conc4000NW	20	Avalanche	N/A
9	WP11	N29	N1	N30	N31	Concrete	Conc4000NW	10	Avalanche	N/A
10	WP12	N31	N30	N32	N33	Concrete	Conc4000NW	10	Avalanche	N/A
11	WP13	N35	N34	N32	N33	Concrete	Conc4000NW	10	R5	N/A
12	WP14	N39	N38	N36	N37	Concrete	Conc4000NW	20	Avalanche	N/A
13	WP5	N14	N5	N40	N12	Concrete	Conc4000NW	20	Avalanche	N/A
14	WP15	N41	N25	N22	N23	Concrete	Conc4000NW	20	Avalanche	N/A
15	WP9	N24	N20	N25	N41	Concrete	Conc4000NW	20	Avalanche	N/A
16	WP16	N44	N40	N42	N43	Concrete	Conc4000NW	10	Avalanche	N/A

Wall Panel Advanced Data

	Label	Seismic Rule	Design Method	SSAF	Stud Bracing	Sheathing Connect Dist [in]
1	WP1	SDR_Conc1	N/A	N/A	N/A	N/A
2	WP2	SDR_Conc1	N/A	N/A	N/A	N/A
3	WP3	SDR_Conc1	N/A	N/A	N/A	N/A
4	WP4	SDR_Conc1	N/A	N/A	N/A	N/A
5	WP6	SDR_Conc1	N/A	N/A	N/A	N/A
6	WP7	SDR_Conc1	N/A	N/A	N/A	N/A
7	WP8	SDR_Conc1	N/A	N/A	N/A	N/A
8	WP10	SDR_Conc1	N/A	N/A	N/A	N/A
9	WP11	SDR_Conc1	N/A	N/A	N/A	N/A
10	WP12	SDR_Conc1	N/A	N/A	N/A	N/A
11	WP13	SDR_Conc1	N/A	N/A	N/A	N/A
12	WP14	SDR_Conc1	N/A	N/A	N/A	N/A
13	WP5	SDR_Conc1	N/A	N/A	N/A	N/A
14	WP15	SDR_Conc1	N/A	N/A	N/A	N/A
15	WP9	SDR_Conc1	N/A	N/A	N/A	N/A
16	WP16	SDR_Conc1	N/A	N/A	N/A	N/A

Diaphragms

	Node Label	Plane	Inactive	No Wind/Drift
1	N29	ZX	Yes	
2	N1	ZX	Yes	

STRUCTURAL SPECIFICATION

SPECIAL INSPECTIONS

IBC 2018, TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARD (a)	IBC REFERENCE
1. Inspection of reinforcing steel, including pre-stressing tendons, and placement.	-	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. Inspection of reinforcing steel welding in accordance with table 1705.2.2, item 2b.	-	-	AWS D1.4 ACI 318: 26.6.4	-
3. Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used.	-	X	ACI 318: 17.8.2	-
4. Inspection of anchors post installed in hardened concrete members.	-	X	ACI 318: 17.8.24, 17.8.2	-
5. Verifying use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C 172 ASTM C 31 ACI 318: 25.5, 26.12	1908.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. Inspection for maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X X	- -	ACI 318: 26.10	-
10. Erection of precast concrete members.	-	X	ACI 318: 26.9	-
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.11.2	-
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.11.1.2(b)	-

a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

AISC 360-16 CHAPTER N
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

WELDING INSPECTION TASK	TABLE REFERENCE
PRIOR TO WELDING	TABLE N5.4-1
DURING TO WELDING	TABLE N5.4-2
AFTER TO WELDING	TABLE N5.4-3
BOLTING INSPECTION TASK	
PRIOR TO BOLTING	TABLE N5.6-1
DURING TO BOLTING	TABLE N5.6-2
AFTER TO BOLTING	TABLE N5.6-3

AISC 341-16 CHAPTER J
REQUIRED VERIFICATION AND INSPECTION OF SEISMIC STEEL MOMENT FRAMES AND BRACED FRAMES

WELDING INSPECTION TASK	TABLE REFERENCE
PRIOR TO WELDING	TABLE J6.1
DURING TO WELDING	TABLE J6.2
AFTER TO WELDING	TABLE J6.3
BOLTING INSPECTION TASK	
PRIOR TO BOLTING	TABLE J7.1
DURING TO BOLTING	TABLE J7.2
AFTER TO BOLTING	TABLE J7.3

GENERAL NOTES

The General Contractor shall verify all existing site conditions and coordinate dimensions among all drawings prior to proceeding with any work or off site fabrication.

Any discrepancies found among the drawings, specifications and notes shall be reported to the Engineer Of Record for clarification.

Contractor to submit a request to Engineer for any substitution of materials or products specified in the contract drawings or specifications.

Contractor to provide shop drawings to the Engineer for review prior to the fabrication and erection of the following items: Structurally Insulated Panels (SIP's), Structural Steel and Miscellaneous Metals, Manufactured Wood Joists and Trusses.

Holes, notching or other penetrations through structural members shall not be permitted without prior Engineer approval.

It is the responsibility of the General Contractor for safety and protection within and adjacent to the job site.

CONCRETE & REINFORCEMENT

CONCRETE
Structural concrete shall be of normal weight concrete (145pcf) with a maximum aggregate size of 3/4" conforming to ASTM C 33, and shall meet the following criteria:

LOCATION	MINIMUM 28day COMPRESSIVE STRENGTH, psi	MAXIMUM WATER-CEMENT RATIO (b)	MAXIMUM SLUMP, inches (a)	AIR-ENTRAINMENT PERCENT ± 1.5%	CEMENT TYPE
ALL STRUCTURAL CONCRETE	4500	.50	4	6	II

a) Maximum slump based on maximum water-cementitious ratio. Mid and high range water reducing agents can be used to increase slump beyond these maximums with Approval of Engineer.
b) Water shall not be added at the job site such that the water-cementitious ratio is exceeded.

CONCRETE BATCHING, MIXING, TRANSPORTATION, PLACEMENT, CONSOLIDATION, HOT & COLD WEATHER PROTECTION
Concrete batching, mixing, and transportation shall conform to ACI 304R.
Cement to conform to ASTM C 150.
Aggregates to conform to ASTM C 33.
Water shall conform to ACI 318-3A.
Placing of concrete shall conform to ACI 304R and ACI 318-5.10.
Pumping of concrete shall conform to ACI 304.2R.
No more than 90 minutes shall elapse between batching and placement of concrete.
Form work shall conform to ACI 347R and ACI 318-6.1.
Reinforcing steel and Embedded items shall be clean and free of foreign debris and be tied securely in place and care taken not to displace during concrete placement.
Conduits and Pipes shall not be embedded in concrete without Engineers written approval.
Consolidation of concrete shall conform to ACI 309R. The unconfined fall of concrete shall not exceed 5'-0".
Hot weather concreting shall conform to ACI 305R.
Cold weather concreting shall conform to ACI 306R.
Concrete shall not be placed on disturbed soil, frozen soil, or placed in water.
Forms shall not be stripped from walls and footings until concrete strength reaches a minimum of 1000psi. Forms supporting suspended slabs shall not be stripped until full 28day specified compressive strength is achieved.

CONCRETE WALLS
Provide dowels from footing to wall to match vertical reinforcement size, spacing and location with embed hooks minimum 12 bar diameters in length, U.O.N.

Provide corner bars with 2'-0" long legs to match horizontal reinforcement size, spacing and location unless otherwise noted in drawings. Lap splice horizontal steel full length with corner bars.

Reinforcing steel shall be continuous through all cold joints.

Stem walls shall not be back filled until main floor is framed and sheathed, and concrete has cured a minimum 7 days.

Provide adequate drainage behind walls as required to prevent standing water behind walls.

Anchor bolts shall be ASTM F1554 Grade 36 and of the size and spacing as indicated on the drawing and have a 7" minimum embedment depth. Anchor bolts to be within 1'-0" of all plate ends, with a minimum of two per wall, and closer than 6" from concrete wall corners.

CONCRETE SLABS ON GRADE
Unless otherwise noted on drawings, concrete slabs on grade to be minimum 6" thick, reinforced with #4 @ 12"o.c. each way placed at slab centerline.

Slabs to be placed over 6" thick compacted gravel base over undisturbed or compacted native strata.

All surfaces of construction joints shall be free of dust, chips and foreign matter prior to casting adjacent slab. Reinforcement shall be continuous through construction and crack control joints.

Provide 3/8" thick expansion joint material and sealant between slab edges and abutting walls and columns unless otherwise noted on the drawings.

Provide 3/4" deep tooled or saw-cut crack control joints at a maximum of 15'-0" apart in both directions. Fill joint with and elastomeric sealant. Contractor to submit to the Architect/Engineer proposed control and construction joint locations for review prior to concrete placement.

REINFORCING STEEL
Reinforcing steel shall conform to ASTM A615, grade 60. Welded Wire Fabric shall conform to ASTM A185. Reinforcing steel to be detailed, fabricated, and placed in accordance with ACI 315 and ACI 318.

Reinforcement and deformed bar anchors to be welded shall be A706 weldable or prior approved equal. Welding of rebar to be approved by Engineer. Welding shall conform to AWS D1.4 standards.

LAP SPLICES
Unless otherwise noted, lap splices shall be minimum 48 x bar diameter.

Clear spacing between bars to be greater than 2 bar diameters. Clear cover greater than 1 bar diameter.

Reinforcement concrete cover requirements, unless otherwise noted in drawings, as follows:

(1) Cast against earth 3"
(2) Cast against form,
Exposed to earth or weather 2"
(3) Walls, slabs, joists
Not exposed to earth or weather 3/4"
(4) Beams, columns
Not exposed to earth or weather 1-1/2"

SOIL & FILL

FOUNDATION/SOILS
Design soil bearing pressure = 4000 psf - See Bulter Associates Geotechnical Report

All foundations shall bear on firm, undisturbed, drained, granular soil free of organic material. If soil is disturbed, compact soil in maximum 8" deep lifts to 95% maximum dry density per ASTM D698.

Contractor to notify Engineer if soil conditions are contrary to the assumed design conditions which may require over excavation and placement of structural fill or a lower assumed soil bearing pressure such as clays, silts or organics.

Exterior footings shall bear a minimum of 2'-8" below finished grade unless otherwise noted in the drawings.

STRUCTURAL FILL
Structural Fill to be GW, GP, SW, or Sp soil under the unified classification system.
Structural Fill shall consist of 4" minus select, clean, granular soil with no more than 12% passing the #200 sieve.
Fill shall be placed in lifts of no more than 8", moisture conditioned, and compacted to 95% of modified proctor density ASTM D1557.
Structural Fill placed below footings must extend laterally outside the perimeter of the footing for a distance equal to the thickness of the fill measured from the bottom of the footing to the underlying undisturbed soil.
Back fill behind stem walls and retaining walls to be the same as prescribed above, except the maximum aggregate size should be 2". Compaction of back fill behind walls shall be done by hand compactors.

DESIGN CRITERIA

BUILDING CODE
Design, construction, and inspection shall conform to the International Building Code, (IBC), 2018 Edition and International Residential Code, 2018 Edition and all Local Codes that may be applicable.

Material test standards referenced shall be the edition referenced in the 2018 IBC.

RISK CATEGORY OF BUILDING: II

DESIGN LOAD CRITERIA
At all times, the General Contractor and Owner shall keep the loads on the structure within the limits of the design load criteria.

The General Contractor is responsible to provide all bracing and shoring as required to support the loads that may be imposed on the structure during construction until all structural elements are complete.

DESIGN ROOF LOADS

Live Load (Snow)	100 PSF (Balanced Snow Load)
Dead Load	20 PSF
Importance Factor Snow (Is)	1.0
Drift and Un-Balanced Loads per ASCE/SEI 7-16	
Ground Snow Load	120 PSF
Exposure Factor (Ce)	1.0
Temperature Factor (Ct)	1.1

DESIGN FLOOR LOADS

Live Load	40 PSF
Dead Load	20 PSF

DESIGN DECK LOADS

Live Load	40 PSF
Dead Load	35 PSF

WIND LOAD DATA

Wind Speed (3 sec. gust)	103 MPH
Importance Factor (Iw)	1.0
Building Category	II
Exposure Category	B
Internal Pressure Coefficient	+/- 0.18

SEISMIC LOAD DATA

Project Coordinates	(43.69, -114.4)
Importance Factor (Is)	1.0
Ss	0.631
S1	0.194
Sds	0.545
Sd1	0.287
Site Class	D
Seismic Design Category	D

Basic Seismic Force Resisting System - Light Frame Walls with Wood Structural Panels
Response Modification Coefficient (R) = 6.5
Equivalent Force Analysis Procedure
F = 1.0
Vbase (unmodified) 0.084*W
Seismic Weights (W) Dead Loads + 35% Balanced Snow Load

STRUCTURAL STEEL

STRUCTURAL STEEL AND MISCELLANEOUS METALS
All structural steel, fabrication, painting, and erection shall comply with AISC Manual of Steel Construction including the Code of Standard Practice and the IBC 2018 edition.

All wide flange sections shall conform to ASTM A992 yield stress = 50 ksi.

All plates, angles, and channels to conform to ASTM A36 yield stress = 36 ksi.

All structural steel tubing to conform to ASTM A500 grade B yield stress = 46 ksi.

All structural steel pipe shall conform to ASTM A501 grade B yield stress = 36 ksi.

Use ASTM A325 bolts where specified in documents for all steel to steel connections with a minimum diameter of 5/8".

Threaded rod to be welded shall conform to ASTM A307 S1 or ASTM F1554 Grade 36. Alternate weldable steel materials may be used with Engineer prior approval.

All bolts shall be tightened to the minimum bolt tension in Accordance with AISC Specifications For Structural Joints Using ASTM A325 or A490 Bolts. Direct tension indicators or twist-off-type tension-control bolt assemblies may be used. Provide carbonized washers between turned element and steel. Connections indicated as slip critical (SCr), shall have a minimum of a Class A contact surface preparation and bolts tightened to the specified minimum bolt tension utilizing direct tension indicators.

Holes in structural steel may be made only with Engineer prior approval.

All welding shall be performed in accordance with a Welding Procedure Specification (WPS) as required in AWS D1.1 Structural Welding Code and the IBC 2018 code.

Weld Filler to comply with E70XX low hydrogen electrodes with a Charpy-V-Notch (CVN) of 20 foot-pounds at -20 degrees F. The WPS shall be within the parameters established by the filler metal manufacturer.

Welder shall be certified by AWS standards within the past 12 months. Upon request, written certification shall be submitted to the Architect/Engineer or special inspectors for review.

Welder shall avoid welding directly in the K-area of structural steel.

Shop drawings shall be approved by Engineer prior to fabrication or erection. Shop drawing submittal shall include, but not be limited to, all welding, bolting, dimensions, member size and grade.

CONCRETE MASONRY

Concrete masonry materials and construction shall conform to the American Concrete Institute (ACI) 530.
All concrete masonry units shall conform to ASTM C 90, Grade N-1, and normal weight. Minimum net area compressive strength of masonry units shall be 2,500 PSI at 28 days.
Mortar for all work shall be type M or S.
Grout for filling shall be a minimum compressive strength (f'm) of 2800 psi, and shall conform to ASTM C476, place grout filling 8'-0" maximum lift vertically.
All reinforcing bars for masonry construction shall conform to ASTM A-615 grade 60. Lap length shall be minimum 40 bar diameters.

WOOD FRAMING

SAWN STRUCTURAL LUMBER
Structural lumber shall conform to the latest edition of the West Coast Lumber Inspection Bureau (WCLIB) or Western Wood Products Association (WWPA) grading rules for the specified sizes and minimum grades listed below:

2x & 4x Douglas Fir-Larch No.2
6x and larger Douglas Fir-Larch No.1

Wood Members in contact with concrete or masonry walls below grade or supported by concrete or masonry foundations that are less than 8" from exposed earth shall be naturally durable wood or preservative-treated per AWPA U1. See IRC section 2304.11 for additional decay and termite protection requirements.

LAMINATED VENEER LUMBER (LVL)
Laminated Veneer Lumber shall conform to the minimum allowable design properties listed below. LVL material to be of solid sections. Substitution of multiple piece sections requires Engineer's prior approval.

Where multiple piece LVL sections are specified in drawings, nail two ply and three ply LVL sections with (3) rows 16d common at 12"o.c. each ply.

LVL Minimum Allowable Design Properties:

1-3/4" thick		3-1/2" - 7" thick	
Fb (bending) =	2800psi	Fb (bending) =	3100psi
Fv (horizontal) =	285psi	Fv (horizontal) =	285psi
Fc (parallel) =	3000psi	Fc (parallel) =	3000psi
Fc (perpendicular) =	750psi	Fc (perpendicular) =	750psi
E =	2,000,000psi	E =	2,000,000psi

GLUED-LAMINATED TIMBER
All Glued-Laminated Timber shall conform to the AITC 117 Combination 24F-V8 DF/DF 1.8E unless noted otherwise in drawings. Enclosed or wrapped glued-laminated timbers to be industrial grade finish. Exposed glued-laminated timbers to be architectural grade finish or as indicated in drawings.

Fabrication shall be in accordance with AITC 117. Provide wet use adhesives. Maximum moisture content shall be 15%.

Timbers to be fabricated with single piece lumber across the width or multiple pieces that have been edge bonded.

Install Glued Laminated Timber beams with "TOP SIDE" up as designated on beam.

MANUFACTURED WOOD JOISTS
Manufactured wood "I's" joists, to be manufactured by RedBUILT, Truss Joist Corporation or Boise Cascade, and to be of the type and spacing specified in the drawings.

Joists shall be erected, installed and braced per manufacturer's specifications.

Other manufactured wood joists may be substituted with prior Engineer approval.

All holes must be cut within joist web and meet manufacturer's requirements.

WOOD FRAMING
Conventional Light Framing construction shall conform to IRC section 2308.

All framing fastening shall be in accordance with IRC section 2304.9 unless otherwise noted on the drawings.

Minimum header shall be (3) 2x8 unless otherwise noted in drawings.

Minimum header post shall be 2x6 bearing (trimmer) stud plus 2x6 king stud each end below 6x8 and (2) 2x6 trimmer studs plus 2x6 king stud for 6x10 and larger, unless otherwise noted in drawings.

Typical beam pocket at beam bearing locations shall consist of full beam width 2x6 bearing trimmers and 2x6 grabber stud each side. Where 2x6 grabber studs are not possible, provide Simpson MTS20 or ST6224 steel strap attached equally to beam and bearing stud.

Provide minimum 1-1/4" thick solid blocking below all bearing walls. Provide minimum 1-1/4" thick solid rim board at perimeter of all floors.

Provide solid blocking in floor space below all posts and trimmers from above. Where "I" joists interrupt blocking, provide joist web stiffeners and blocking per manufacturers recommendations.

Typical wall construction to consist of 2x6 studs @ 16"/24"o.c. module with framing members above, U.O.N.
Where wall heights exceed 13'-0", wall construction to consist of 1-1/2"x5-1/2" BCI 2.0E VERSA-STUD at 16"o.c. (or equivalent).

PLYWOOD SHEATHING
All plywood sheathing shall be APA rated exposure 1 plywood with thickness, veneer grades and span ratings as noted herein or in drawings.

Plywood at roof and floors shall be laid with face grain perpendicular to supports and end joints staggered at 4'-0" o.c.. Provide 1/8" space at all panel edges.

Nail roof sheathing with 10d common (0.148"ø x 3") at 6"o.c. boundary edges, 6"o.c. interior panel edges, and 12"o.c. intermediate unless otherwise noted on drawings. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Glue floor sheathing and nail with 10d common (0.148"ø x 3") at 6"o.c. boundary edges, 6"o.c. interior panel edges, 12"o.c. intermediate unless otherwise noted. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Unless otherwise noted in drawings and shear wall schedule, nail APA rated wall panel edges and boundaries with 8d galvanized box (0.131"ø x 2½") at 6"o.c., and 12"o.c. intermediate. Block and edge nail all horizontal panel edges at designated shear walls. Nails shall be driven with the head of the nail flush with the surface of the sheathing, over-driven nails will be subject to rejection.

Roof Sheathing:
5/8" CDX minimum (40/20) span rating.

Floor Sheathing:
3/4" CDX T&G minimum (48/24) span rating.

Exterior Wall Sheathing:
15/32" CDX minimum (24/0) span rating unless otherwise noted. 7/16" Oriented Strand Board with the same span rating may be substituted for exterior wall sheathing with panel long dimension applied perpendicular to wall studs.

NAILS, BOLTS, LAGS AND PREFABRICATED CONNECTIONS FOR WOOD
Unless otherwise noted in drawings or hardware supplier specification, all nails shall be common or galvanized box.

Wood bolts and lags shall conform to ASTM A307 grade unless otherwise noted. Provide mild steel plate washers at all bolt heads and nuts bearing against wood.

Metal connectors specified in drawings shall be manufactured by the Simpson Strong Tie Company and installed per their specifications. Other manufacturers may be considered where load capacity and dimensions are equal or better. All substitutions must be submitted to the Engineer for review.

Provide the maximum nailing pattern for all metal connectors.

Nail or screw substitutions, other than manufacturers specified, must have Architect/Engineer prior approval.

Anchoring adhesive shall be two component 100% solids epoxy based system supplied in manufacturer's standard side-by-side cartridge and dispensed through a static mixing nozzle supplied by the manufacturer. Epoxy shall meet the minimum requirements of ASTM C-881 specification for type I,II,IV and V grade 3, class B and C and must develop a minimum 13,390 psi compressive yield strength after 7 day cure.

FOUNDATION NOTES

SEE SPECIFICATION SHEET FOR CONCRETE DESIGN PROPERTIES, MINIMUM REINFORCEMENT SPLICE LENGTHS, ETC.

PLACE ALL FOOTINGS ON UNDISTURBED STRATA OR COMPACTED STRUCTURAL FILL TO THE MINIMUM REQUIRED FROST DEPTH. FOR MORE INFORMATION SEE GEOTECHNICAL REPORT AND SHEET S1.0

FOOTING BEARING CONDITIONS TO BE VERIFIED PRIOR TO THE PLACEMENT OF CONCRETE FORM WORK.

FOOTING REINFORCEMENT TO BE PLACED AT MINIMUM 3" CLEAR FROM BOTTOM OF FOOTING, U.O.N.

LOCATE HOLD DOWNS AT ENDS OF SHEAR WALL ABOVE

ANCHOR BOLTS TO BE ⅝"ø x10" J BOLTS PLACED 6" FROM ENDS OF WALLS AND @ 48" o.c. BETWEEN U.O.N. PER PLAN AND / OR DETAILS

(32) NUMBER IN SYMBOL DENOTES ANCHOR BOLT SPACING IN INCHES ON CENTER. 48"o.c. MAX.

EXTERIOR WALLS TO BE BACK FILLED WITH COMPACTED FREE DRAINING GRAVEL.

INSTALL RADON ABATEMENT SYSTEM AS MAY BE REQUIRED TO MEET PROVISIONS OF 2018 INTERNATIONAL RESIDENTIAL CODE, APPENDIX F.

FIELD VERIFY ALL FOOTING STEPS AND ELEVATIONS. BOTTOM OF ALL FOOTINGS TO BE A MINIMUM 2'-8" BELOW EXTERIOR FINISH GRADE, SEE GEOTECHNICAL REPORT, GRADING PLAN AND SHEET S1.0 FOR MORE INFORMATION.

FOOTING SCHEDULE

MARK	DEPTH	WIDTH	LENGTH	REINF.
F2.0	1'-0"	2'-0"	2'-0"	(2) #5's E.W.
F4.5	1'-0"	4'-6"	4'-6"	(5) #5's E.W.

1. REINFORCEMENT ASTM A615 GR60
2. PLACE 3" CLEAR BOTTOM FACE

FLOOR AND ROOF FRAMING NOTES

STRUCTURAL FLOOR SYSTEM SHALL BE 3/4" CDX T&G FLOOR SHEATHING GLUE AND NAIL W/ 10d COMMON @ 6"o.c. EDGE, 6"o.c. BOUNDARY, AND 12"o.c. FIELD NAILING OVER I-JOIST PER PLAN, U.O.N.

STRUCTURAL ROOF SYSTEM SHALL BE 5/8" CDX SHEATHING NAIL W/ 10d COMMON @ 6"o.c. EDGE, 6"o.c. BOUNDARY, AND 12"o.c. FIELD NAILING OVER RAFTERS PER PLAN, U.O.N.

FOR TYPICAL BEAM POCKET (NOTED "BP"), AND ALL BEAM BEARING LOCATIONS PROVIDE FULL BEAM WIDTH OF 2x6 TRIMMERS WITH 2x6 KING STUD EACH SIDE. NAIL KING STUD WITH (2) 16d @ 6"o.c. (I5 MINIMUM) TO BEAM AND (1) 16d @ 9" o.c. TO TRIMMER STUD PACK. WHERE KING STUDS NOT POSSIBLE PROVIDE SIMPSON MTS20, OR ST6224 EACH SIDE U.N.O.

PROVIDE SOLID BLOCKING IN JOIST SPACE BELOW ALL POSTS OR TRIMMERS FROM ABOVE. WHERE I-JOISTS INTERFERE WITH SOLID BLOCKING, PROVIDE SQUASH BLOCKING PER JOIST MANUF. INSTRUCTIONS

PROVIDE MST37 STRAP ACROSS ALL BREAK IN TOP PLATES, U.O.N.

WHERE POST STOPS AT A CONTINUOUS HEADER PROVIDE A35 ON EACH SIDE OF POST TO HEADER (10x4½" NAILS TO POST)

NAIL SHEATHING TO ALL MEMBERS LABELED "COLLECTOR" W/ 10d @ 6"o.c. PROVIDE MSTA30 STRAP ACROSS RIDGE AND AT SPLICE LOCATIONS. U.O.N.

WHERE JOISTS FRAME INTO A CONTINUOUS WALL, PROVIDE 1¾ LVL LEDGER TO MATCH JOIST DEPTH, ATTACH LEDGER TO WALL FRAMING W/ (3) SDS25412 SCREWS @ 16"o.c. U.O.N. (USE (2) SDS25412 SCREWS @ 16"o.c. FOR LEDGERS 9½" AND LESS), PROVIDE SOLID WOOD BLOCKING WHERE STUD NOT AVAILABLE.

AT ENDS OF ALL HEADERS, PROVIDE MINIMUM 2x6 TRIMMER AND 2x6 KING STUD BELOW 6x8 HEADER AND (2) 2x6 TRIMMERS AND (1) 2x6 KING STUD UNDER 6x10 HEADER OR GREATER, U.O.N. PER PLAN. NAIL KING STUD WITH (2) 16d @ 6"o.c. ((6) MINIMUM) TO HEADER AND (1) 16d @ 9" o.c. TO TRIMMER STUD PACK, U.N.O.

#T = NUMBER OF TRIMMER STUDS
#K = NUMBER OF KING STUDS
FA = POST FROM ABOVE, SEE UPPER FRAMING FOR POST SIZE.
AF = ACROSS FLOOR
BP = BEAM POCKET
ATR = ALL THREADED ROD ASTM F1554 GRADE 36 OR A307

WHERE STUD HEIGHT EXCEEDS 13'-0" USE LSL OR LVL STUDS PER STRUCTURAL SPECIFICATIONS ON SHEET S1.0.

PARALLEL STRAND LUMBER (PSL) MAY BE SUBSTITUTED FOR LVL MATERIAL WITH THE SAME DIMENSIONS AS NOTED ON PLAN AND WITH DESIGN PROPERTIES PER S1.0.

PROVIDE SOLID BLOCKING W/ IN WALL FRAMING FOR HANDRAIL / GAURDRAIL / GRAB BARS ETC. ATTACHMENT WHERE OCCUR.

ISSUE DATE
CUP SET: FEBRUARY 13, 2023

PRATT RESIDENCE
406 SAGE ROAD KETCHUM, ID

PROFESSIONAL ENGINEER LICENSED 02/13/23 14254 STATE OF IDAHO CRAIG MAXWELL

MAXWELL STRUCTURAL DESIGN STUDIO
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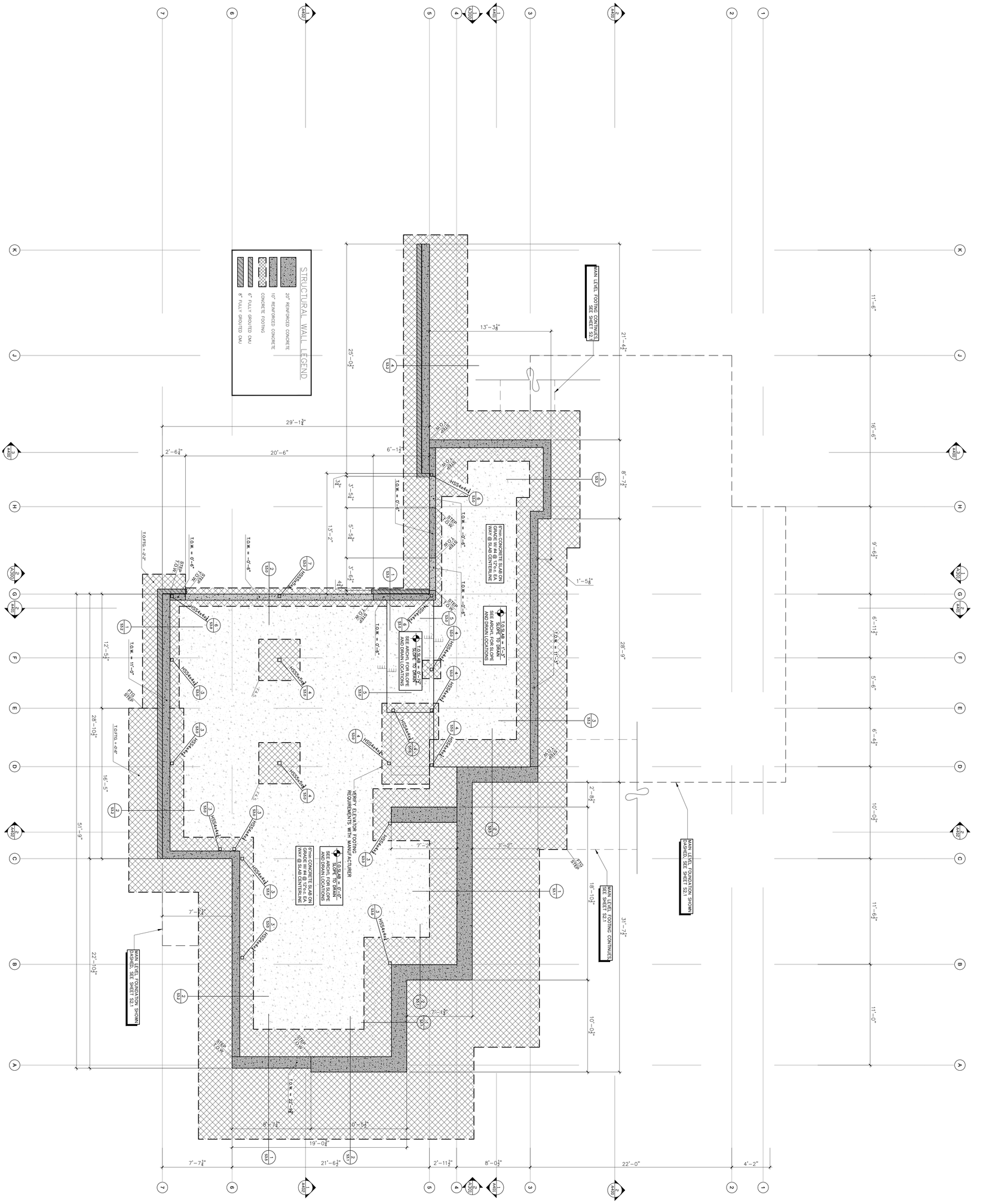
P.O. Box 1151 - Hailey, Idaho 83333
Craig@ maxwellsds.com = 208.721.2171
www.maxwellsds.com

S1.0

FOUNDATION PLAN

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



S2.0

MAXWELL
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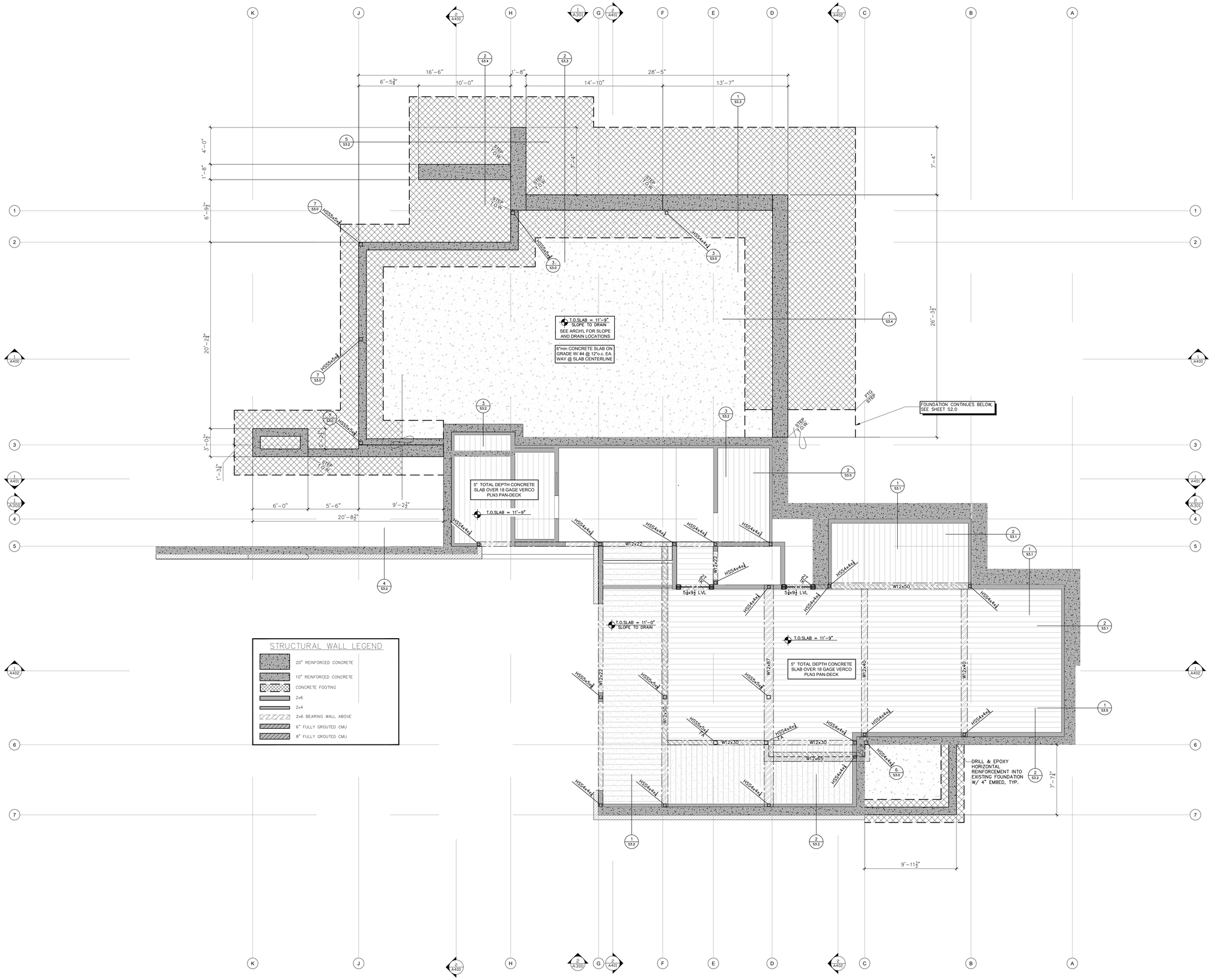
CRAIG MAXWELL — STATE OF IDAHO — 14254 — REGISTERED PROFESSIONAL ENGINEER

PRATT RESIDENCE

406 SAGE ROAD — KETCHUM, ID

ISSUE DATE
CUP SET - FEBRUARY 13, 2023



SECOND LEVEL FLOOR FRAMING PLAN

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

ISSUE DATE

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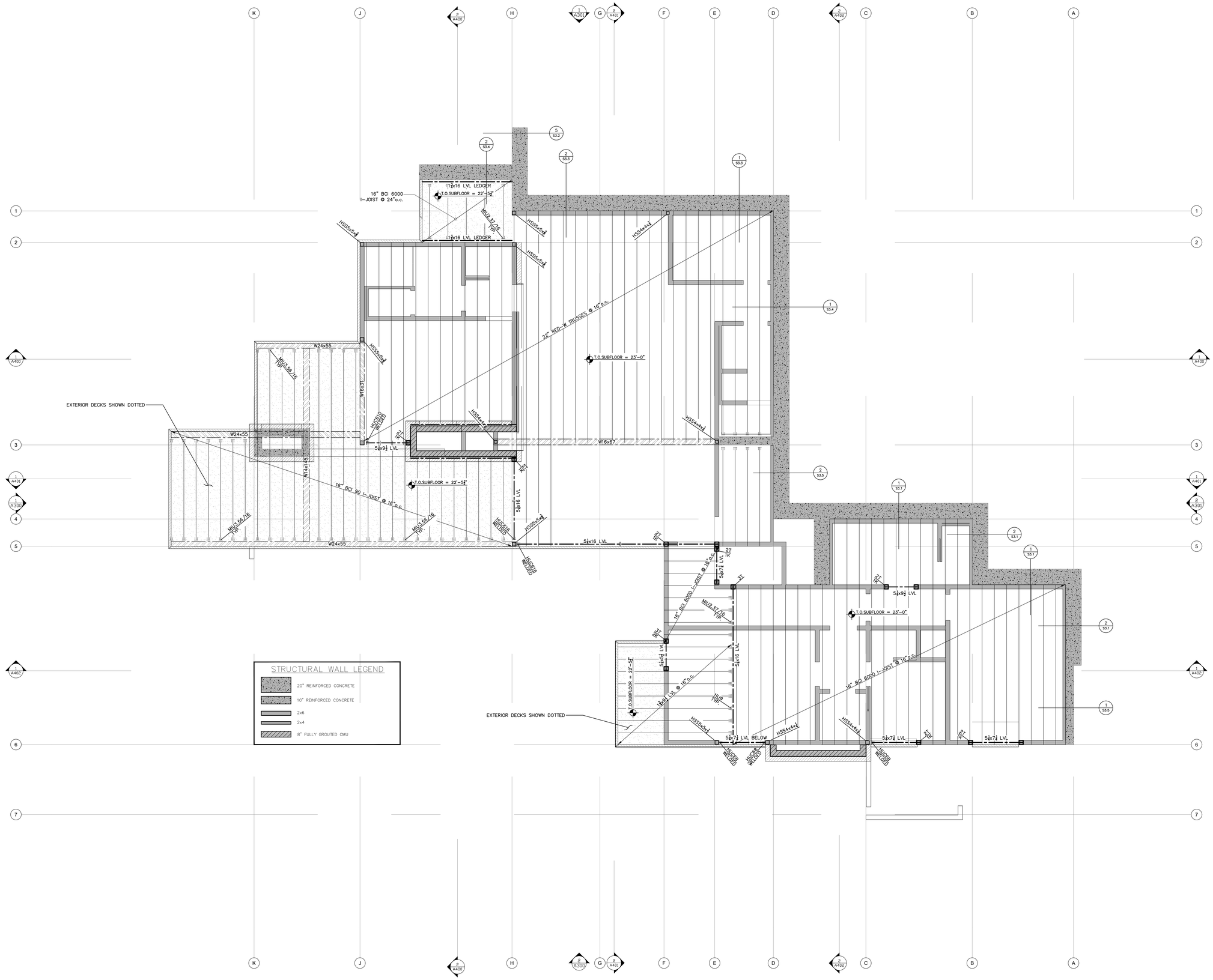
S2.1



THIRD LEVEL FLOOR FRAMING PLAN

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

ISSUE DATE

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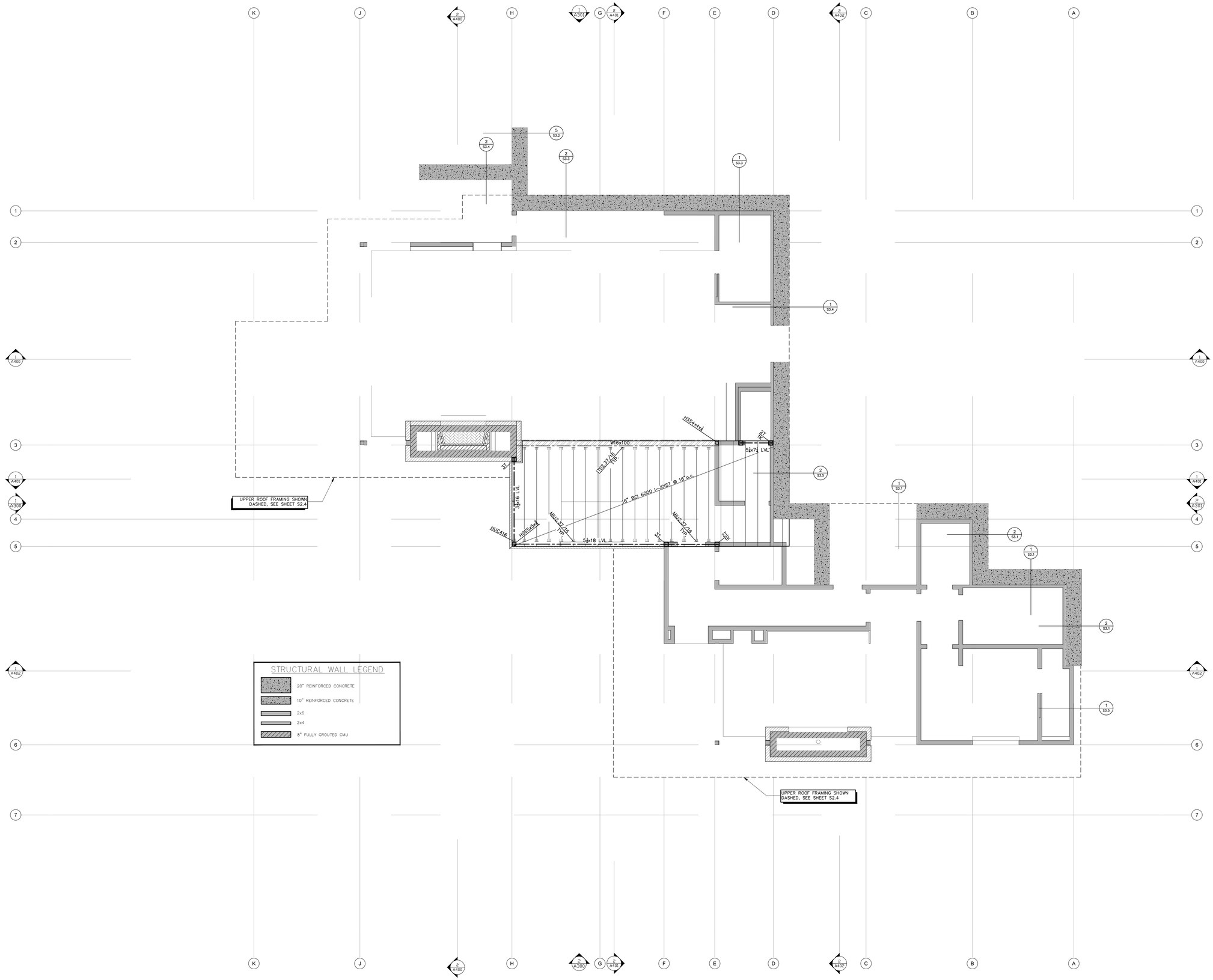
S2.2



LOWER ROOF FRAMING PLAN

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

ISSUE DATE

CUP SET: FEBRUARY 13, 2023

PRATT RESIDENCE

406 SAGE ROAD

KETCHUM, ID

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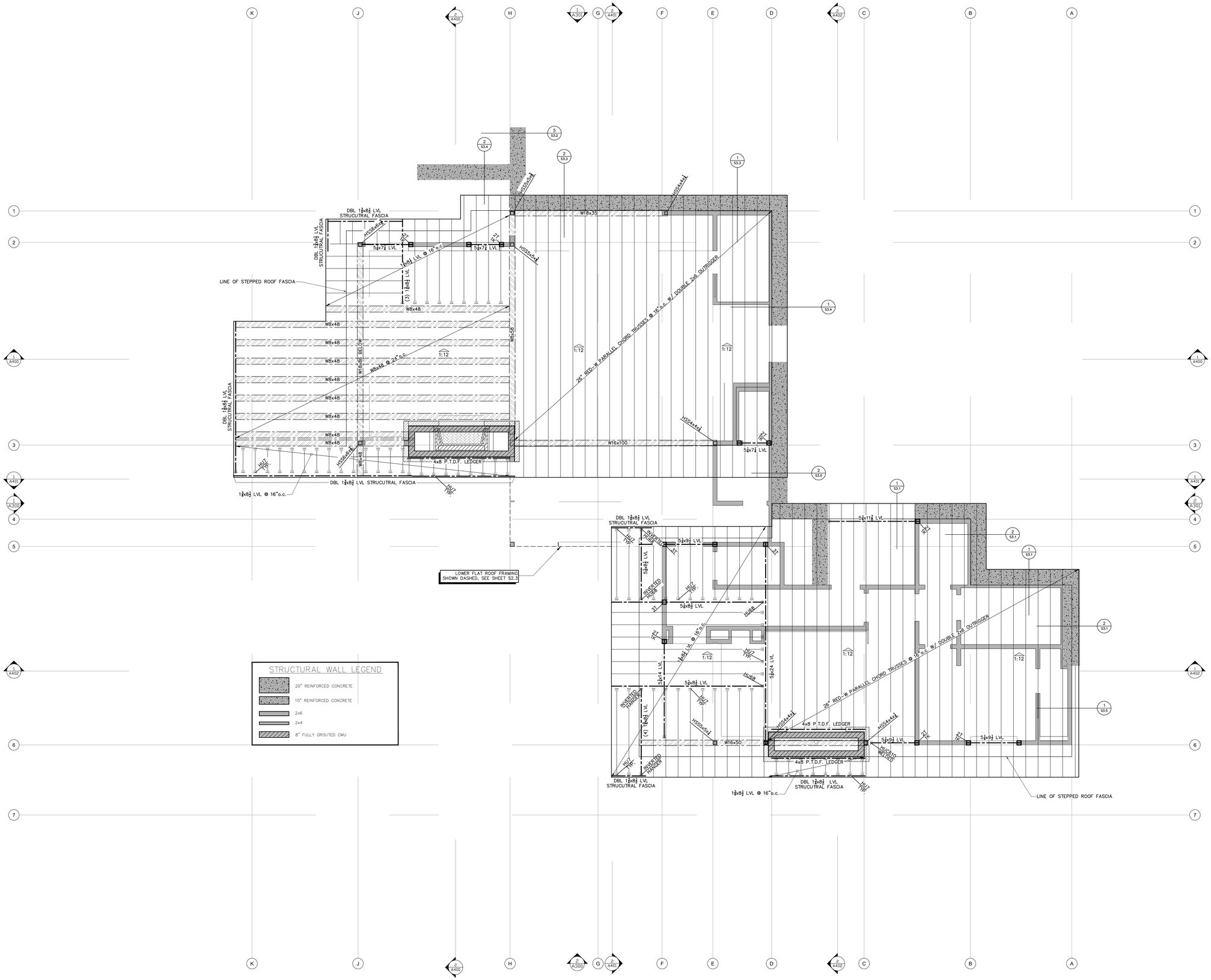
S2.3



UPPER ROOF FRAMING PLAN

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

ISSUE DATE

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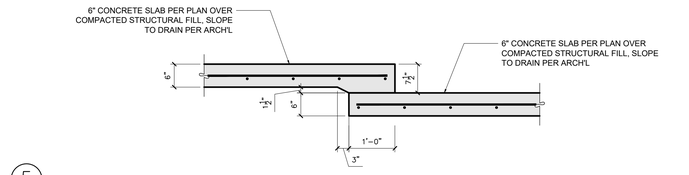
S2.4



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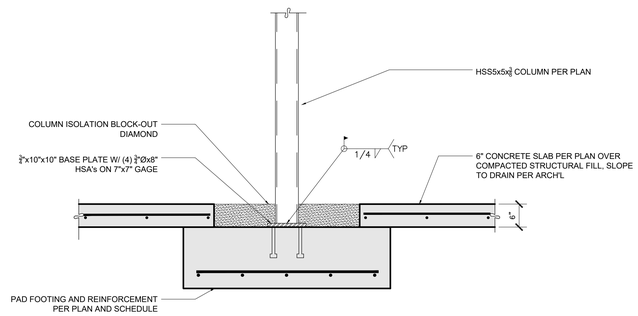

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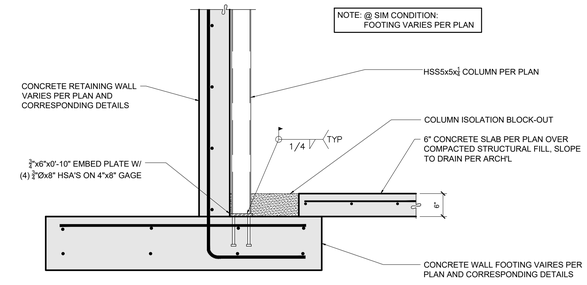

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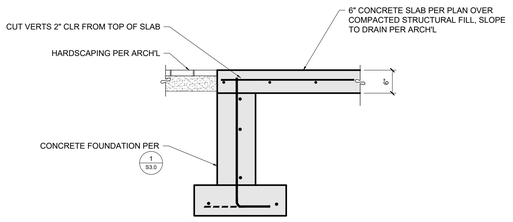

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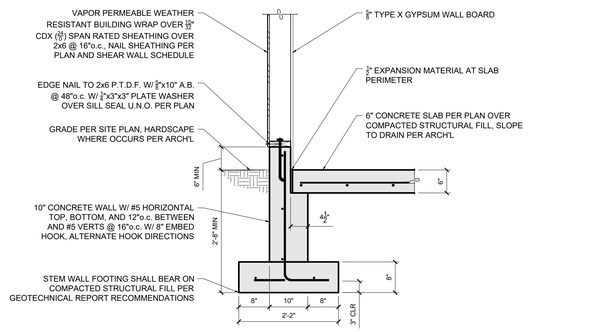

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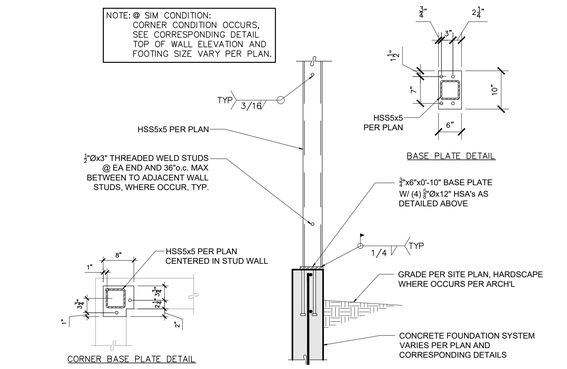
SCALE: 3/4" = 1'-0" U.N.O.



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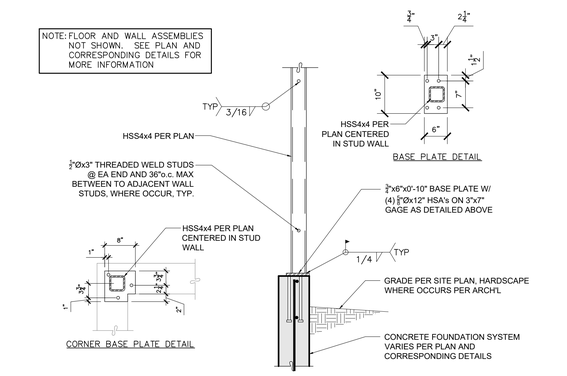

6

ISSUE DATE

CUP SET: FEBRUARY 13, 2023

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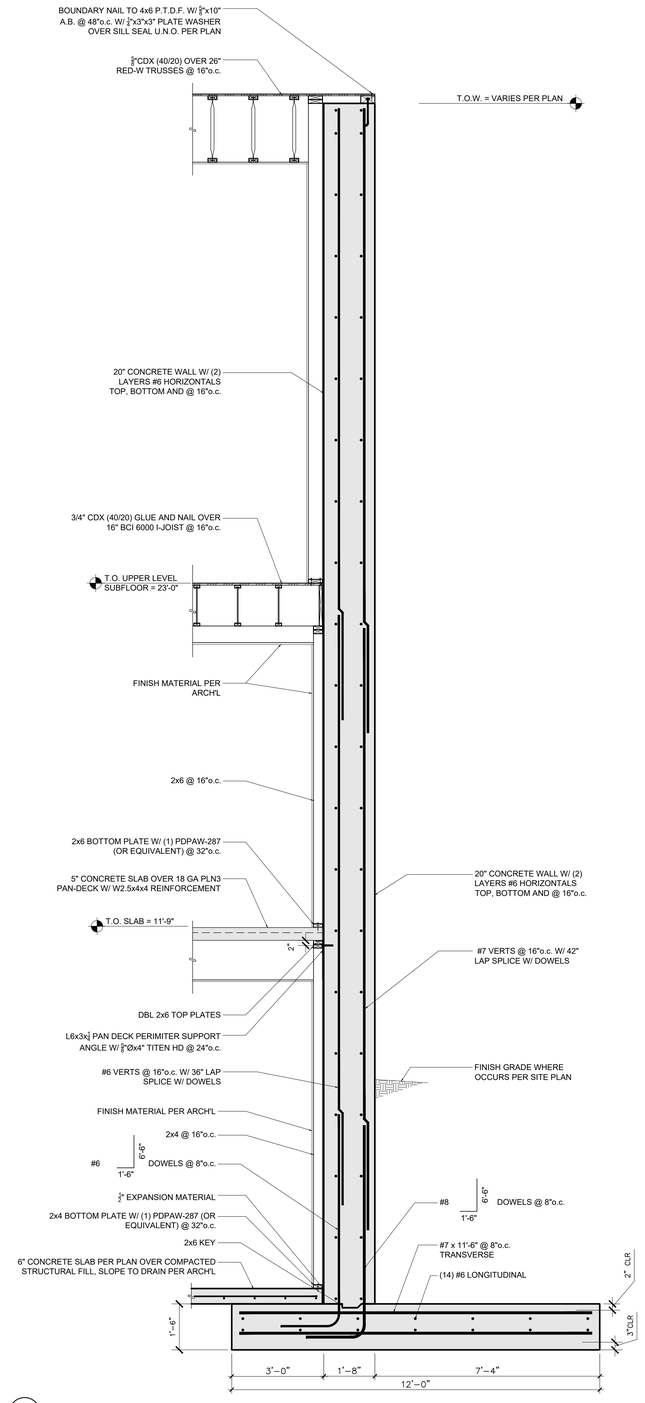
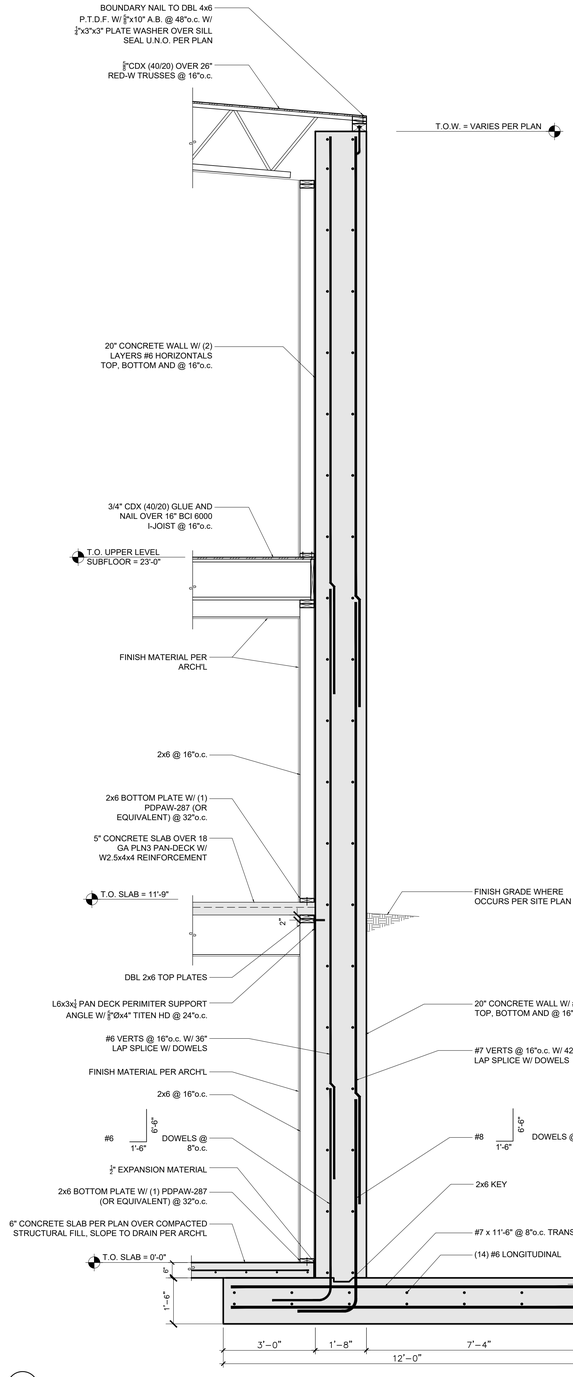
S3.0





SCALE: 1/2" = 1'-0" U.N.O.

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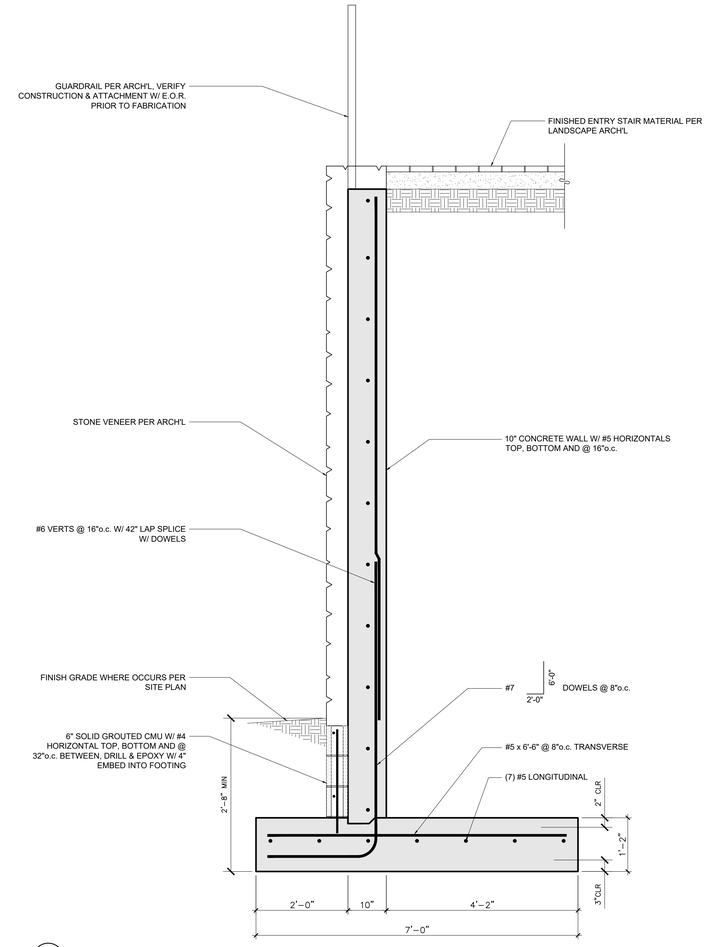
S3.1



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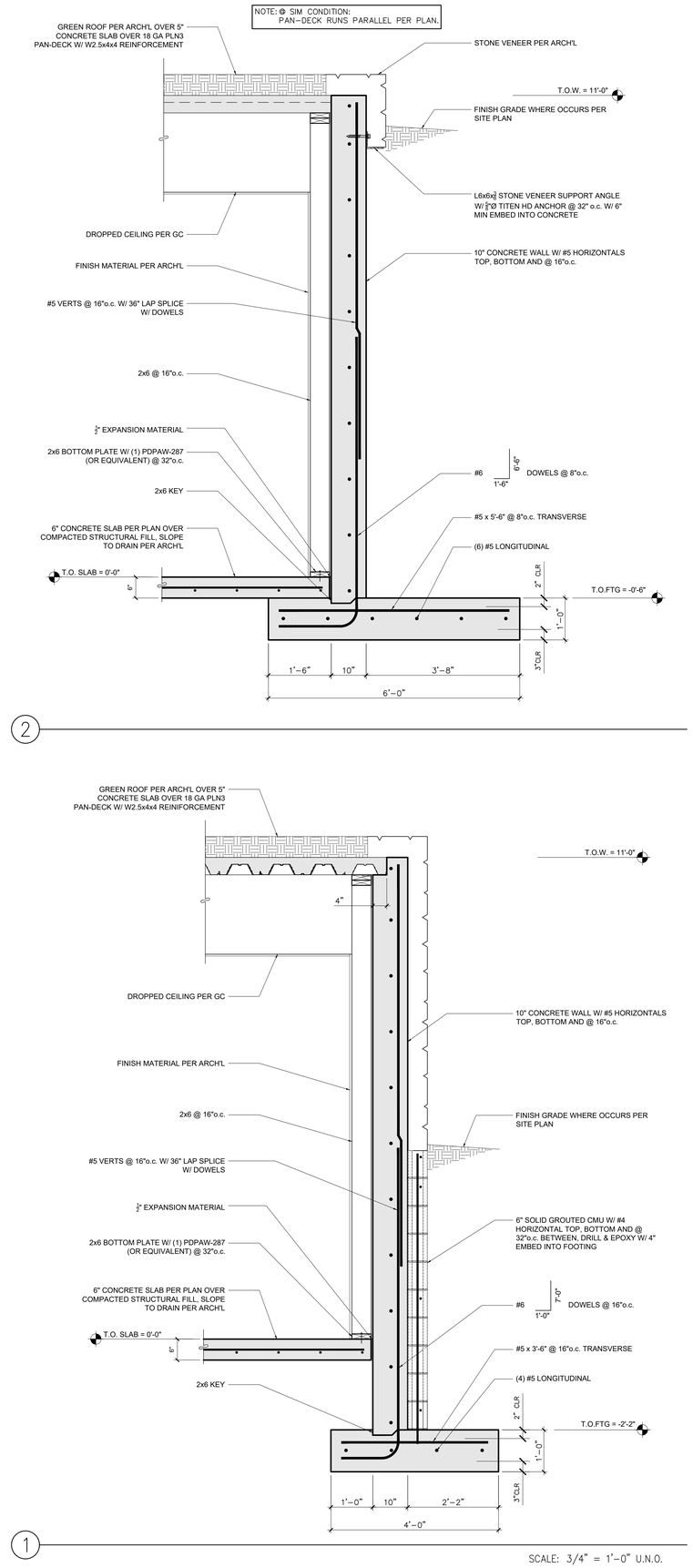

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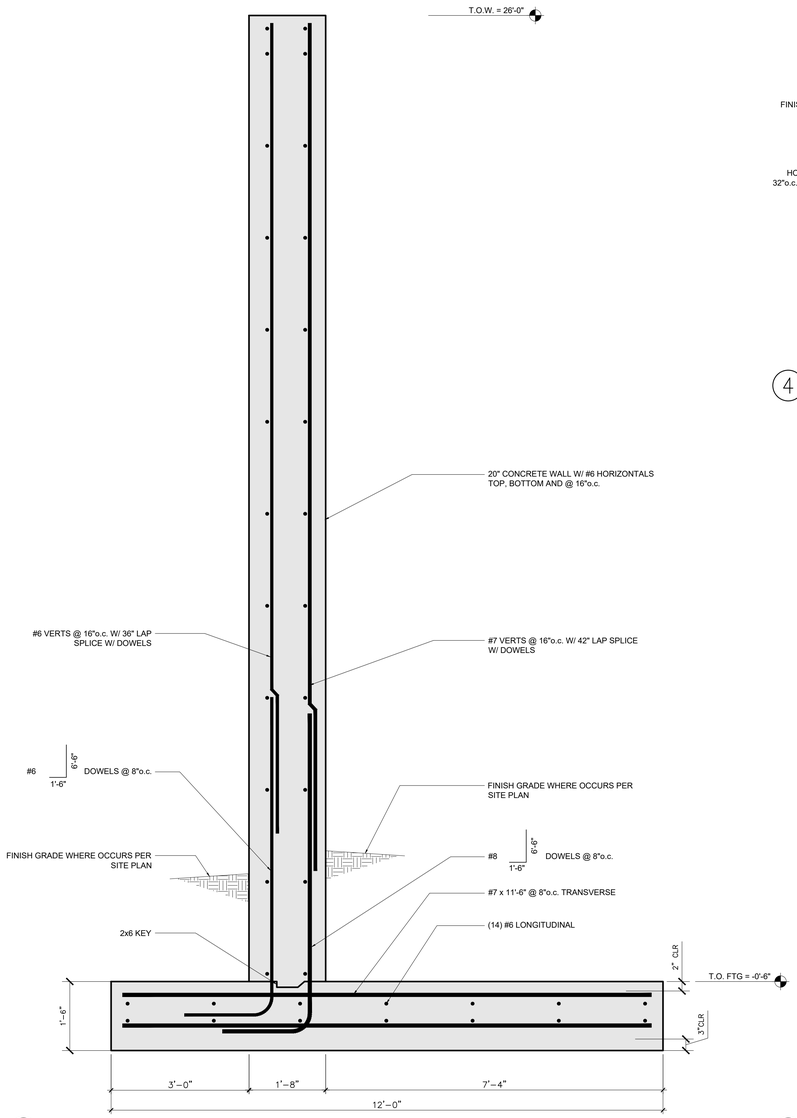

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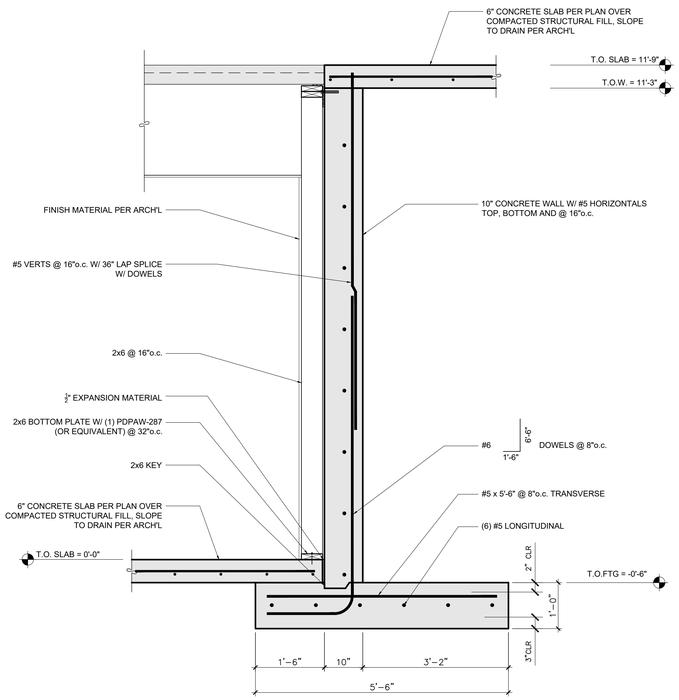

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SCALE: 3/4" = 1'-0" U.N.O.

ISSUE DATE

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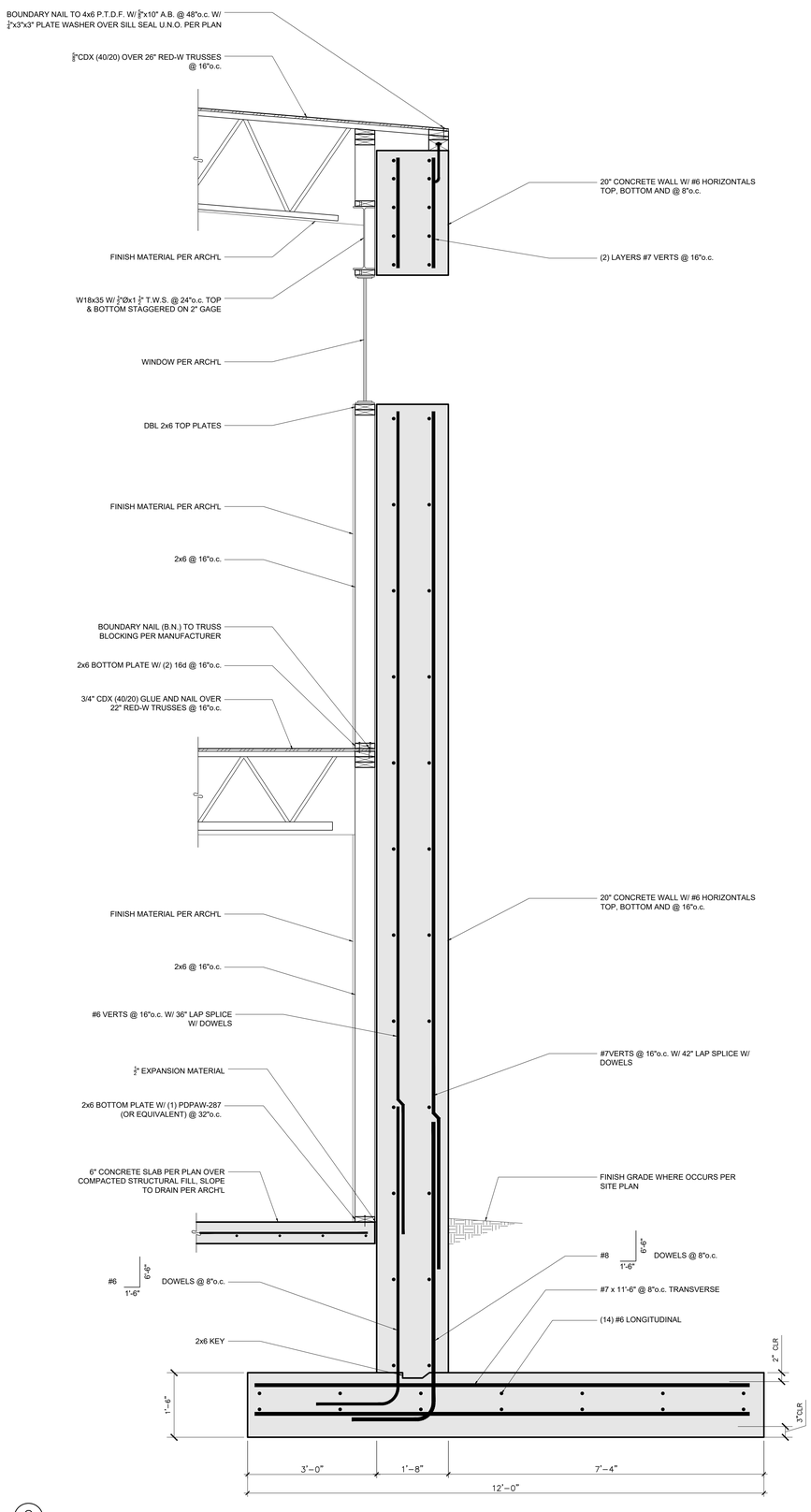
S3.2



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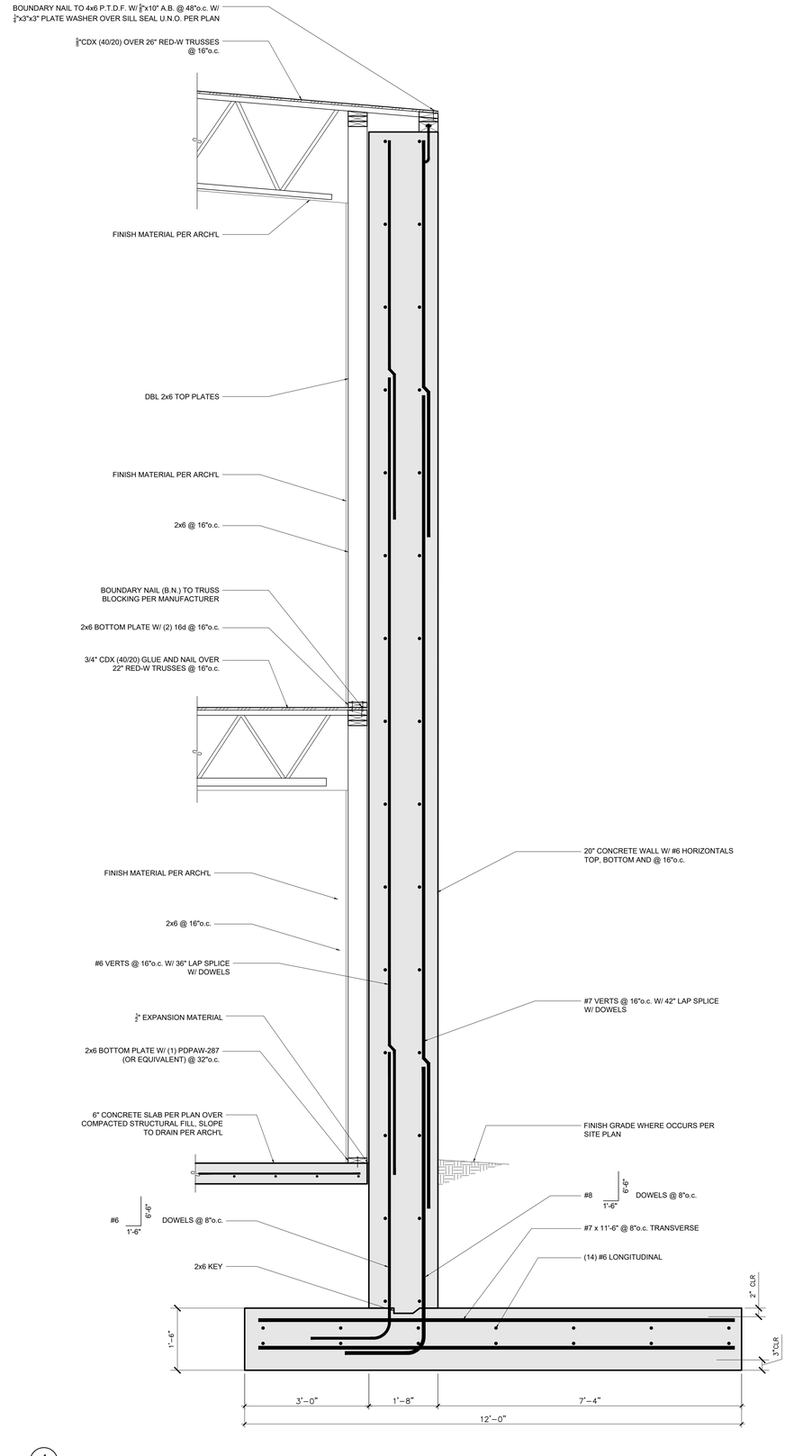

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SCALE: 3/4" = 1'-0" U.N.O.

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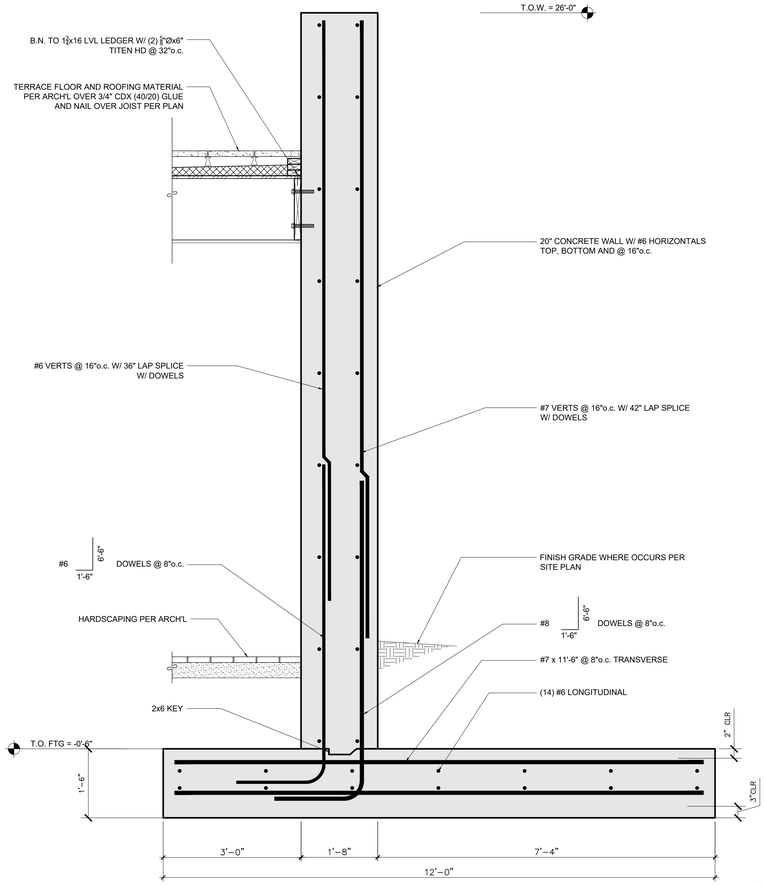
S3.3



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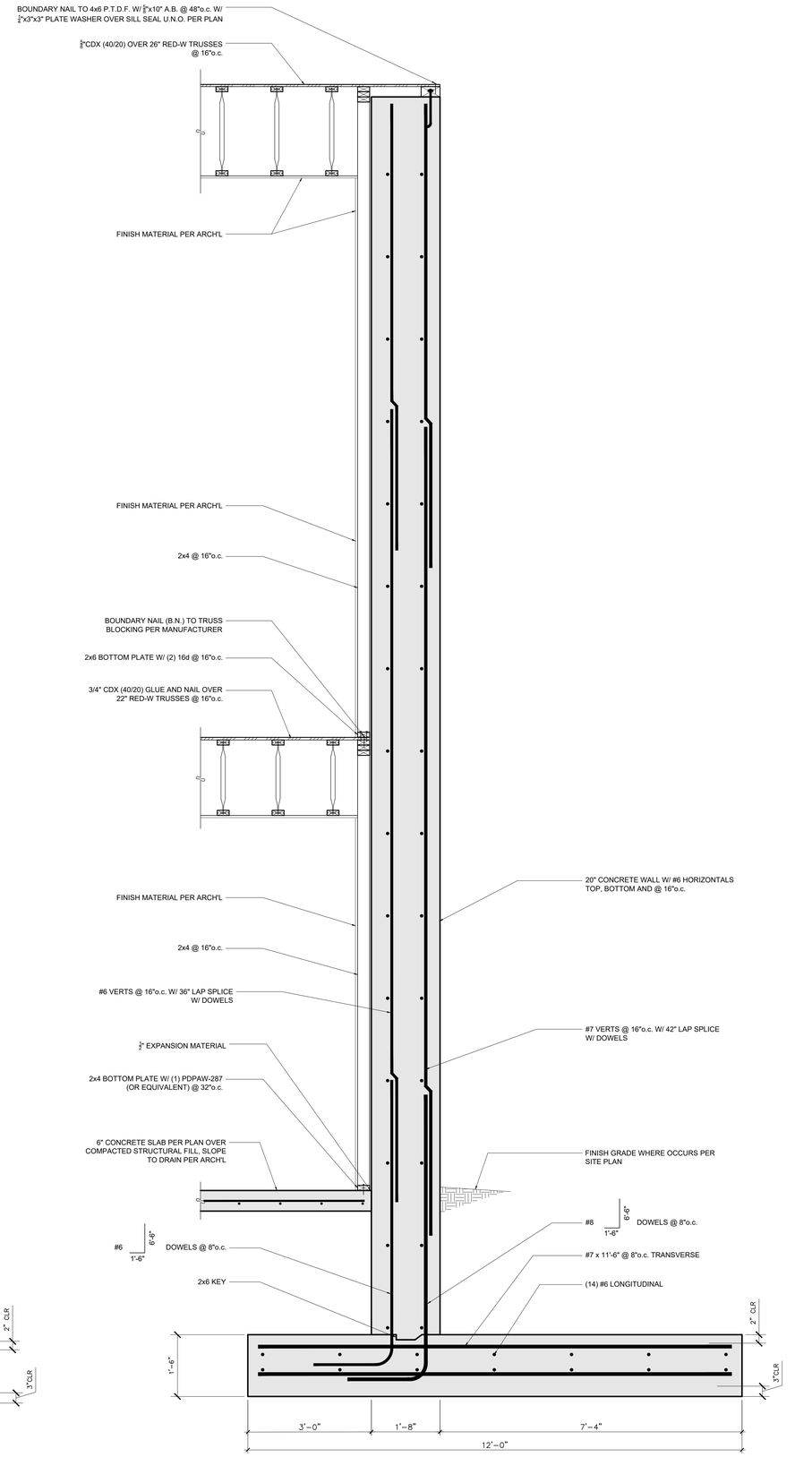

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SCALE: 3/4" = 1'-0" U.N.O.

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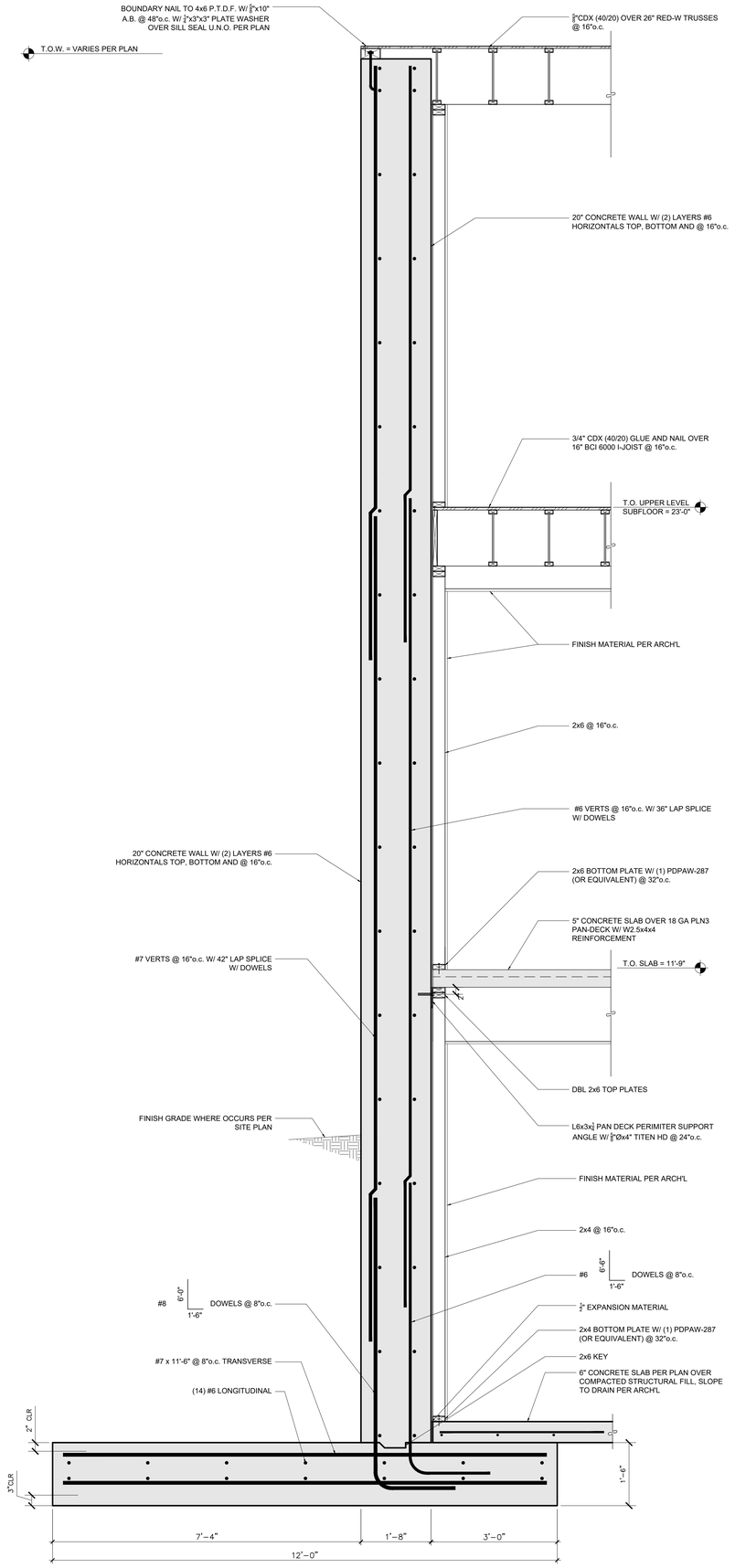
S3.4



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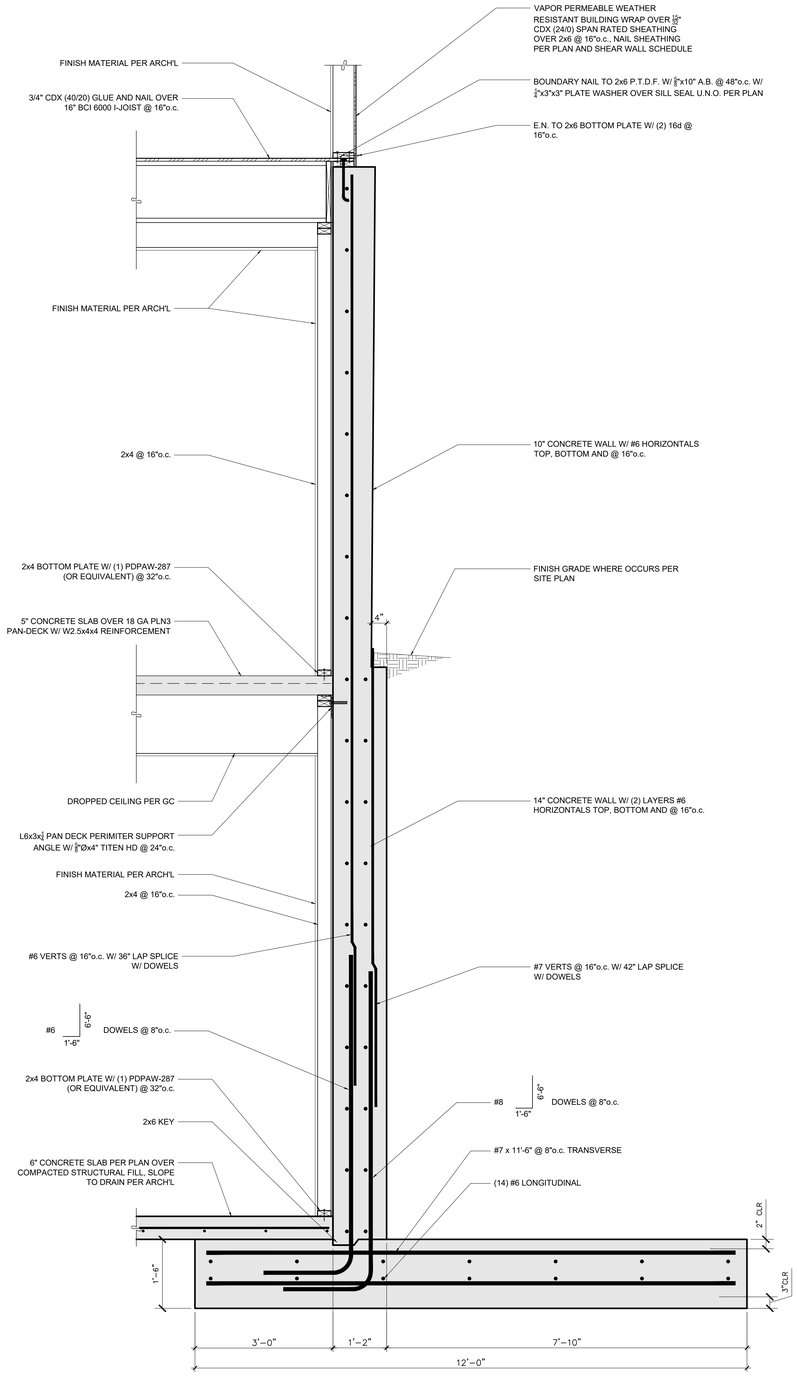

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S3.5

City of Ketchum

Attachment E:

Design Review Standards Analysis

City of Ketchum
Planning & Building

406 Sage Road
DESIGN REVIEW STANDARDS ANALYSIS

17.96.060.A.1 - Streets	Conformance
The applicant shall be responsible for all costs associated with providing a connection from an existing City street to their development.	YES
Finding: The project proposes to construct a new paver driveway that accesses the property from Sage Road. All project costs associated with the development, including the City street connection, are the responsibility of the applicant.	

17.96.060.A.2 - Streets	Conformance
All street designs shall be approved by the City Engineer.	YES
Finding: The City Engineer has reviewed the proposed driveway design and finds it to be sufficient for the project. All street designs shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.	

17.96.060.B.1 - Sidewalks	Conformance
All projects under subsection 17.96.010.A of this chapter that qualify as a "substantial improvement" shall install sidewalks as required by the Public Works Department.	N/A
Finding: N/A. Ketchum Municipal Code 17.124.140 outlines the zone districts where sidewalks are required when substantial improvements are made, which include the Community Core, all tourist zone districts, and all light industrial districts. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for the project. This standard is not applicable.	

17.96.060.B.2 - Sidewalks	Conformance
Sidewalk width shall conform to the City's right-of-way standards, however the City Engineer may reduce or increase the sidewalk width and design standard requirements at their discretion.	N/A
Finding: N/A. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.B.3 - Sidewalks	Conformance
Sidewalks may be waived if one of the following criteria is met: *a) The project comprises an addition of less than 250 square feet of conditioned space.* b) *The City Engineer finds that sidewalks are not necessary because of existing geographic limitations, pedestrian traffic on the street does*	N/A

not warrant a sidewalk, or if a sidewalk would not be beneficial to the general welfare and safety of the public.	
Finding: N/A. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.B.4 - Sidewalks	Conformance
The length of sidewalk improvements constructed shall be equal to the length of the subject property line(s) adjacent to any public street or private street.	N/A
Finding: N/A. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.B.5 – Sidewalks	Conformance
New sidewalks shall be planned to provide pedestrian connections to any existing or future sidewalks adjacent to the site. In addition, sidewalks shall be constructed to provide safe pedestrian access to and around a building.	N/A
Finding: N/A. Ketchum Municipal Code 17.124.140 outlines the zone districts where sidewalks are required when substantial improvements are made, which include the CC, all tourist zone districts, and all light industrial districts. The subject property is located in the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.B.6 - Sidewalks	Conformance
The City may approve and accept voluntary cash contributions in lieu of the above described improvements, which contributions must be segregated by the City and not used for any purpose other than the provision of these improvements. The contribution amount shall be 110 percent of the estimated costs of concrete sidewalk and drainage improvements provided by a qualified contractor, plus associated engineering costs, as approved by the City Engineer. Any approved in lieu contribution shall be paid before the City issues a certificate of occupancy.	N/A
Finding: N/A. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.C.1 - Drainage	Conformance
All stormwater shall be retained on site.	YES
Finding: Pursuant to KMC §17.96.060.C.1, all storm water drainage shall be retained on site. Drainage improvements are specified on Sheet C1.0 of the project plans. The drainage improvements include the installation of a trench drain bordering the width of the driveway. A combination of drywells and catch basins will be installed to collect stormwater from the rest of the property. The City Engineer has reviewed the proposed drainage plan and believes the	

trench drain and drywell improvements are sufficient to maintain all storm water drainage on-site.

All drainage plans and specifications shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.

17.96.060.C.2 - Drainage	Conformance
Drainage improvements constructed shall be equal to the length of the subject property lines adjacent to any public street or private street.	YES

Finding: Drainage improvements are specified on Sheet C1.0 of the project plans. The drainage improvements include the installation of a trench drain bordering the width of the driveway. A combination of drywells and catch basins will be installed to collect stormwater from the rest of the property. The City Engineer has reviewed the proposed drainage plan and believes the trench drain and drywell improvements are sufficient to maintain all storm water drainage on-site.

All drainage plans and specifications shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.

17.96.060.C.3 - Drainage	Conformance
The City Engineer may require additional drainage improvements as necessary, depending on the unique characteristics of a site.	YES

Finding: The City Engineer has reviewed the proposed drainage plan and believes the trench drain and drywell/catch basin improvements are sufficient to maintain all storm water drainage on-site. The City Engineer may require additional drainage improvements if necessary. If approved, the applicant shall submit final civil drawings for all drainage improvements with the building permit application to be verified, reviewed, and approved by the City Engineer and Streets Department.

17.96.060.C.4 - Drainage	Conformance
Drainage facilities shall be constructed per City standards.	YES

Finding: The drainage improvements include the installation of a trench drain bordering the width of the driveway along Sage Road. A combination of drywells and catch basins will be installed to collect stormwater from the rest of the property. The City Engineer has reviewed the proposed drainage plan and believes the proposed trench drain and drywell improvements meet city standards.

All drainage plans and specifications shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.

17.96.060.D.1 - Utilities	Conformance
All utilities necessary for the development shall be improved and installed at the sole expense of the applicant.	YES
Finding: All project costs associated with the development, including the installation of utilities, are the responsibility of the applicant. The applicant has not made requests for funding to the City for utility improvements. No funds have been provided by the City for the project.	

17.96.060.D.2 - Utilities	Conformance
Utilities shall be located underground and utility, power, and communication lines within the development site shall be concealed from public view.	YES
Finding: As shown on Sheet C1.0 of the project plans, the applicant proposes abandoning the existing private well service and connecting to the municipal water and sewer systems from existing lines on Sage Road. Requirements and specification for the water and sewer connections will be verified, reviewed, and approved by the Utilities Department prior to issuance of a Building Permit for the project.	

17.96.060.D.3 - Utilities	Conformance
When extension of utilities is necessary all developers will be required to pay for and install two-inch SDR11 fiber optical conduit. The placement and construction of the fiber optical conduit shall be done in accordance with City of Ketchum standards and at the discretion of the City Engineer.	N/A
Finding: N/A. Extension of utilities is not necessary to service the proposed development.	

17.96.060.E.1 – Compatibility of Design	Conformance
The project's materials, colors and signing shall be complementary with the townscape, surrounding neighborhoods and adjoining structures.	YES
Finding: Pursuant to KMC §17.96.060.E.1, "The project's materials, colors and signing shall be complementary with the townscape, surrounding neighborhoods and adjoining structures." Sage Road features residences built at varying timeframes resulting in a diverse range of materials and architectural styles. This has resulted in mountain modern architectural styles (flat roofs, high percentage of glazing, and cold materials such as concrete and metal) mixed with older traditional styles (pitched roofs and warm materials such as wood and stone). The adjacent structure to the lookers right recently received Design Review approval on June 27, 2023 (File No. P22-070) to demolish the existing three-story traditional log cabin style attached townhouse development with a modern style flat roof and high glazing detached townhomes. The structure to the lookers left is also a three-story high townhouse of a more traditional design that utilizes shed roofs and wood materials. The architectural style of the proposed residence is three stories in height and features a modern design with flat roofs, large windows, and a mix of wood, steel, and stone siding.	

17.96.060.E.2 – Compatibility of Design	Conformance
Preservation of significant landmarks shall be encouraged and protected, where applicable. A significant landmark is one which gives historical and/or cultural importance to the neighborhood and/or community.	N/A
Finding: N/A. The subject property does not contain any significant landmarks.	

17.96.060.E.3 – Compatibility of Design	Conformance
Additions to existing buildings, built prior to 1940, shall be complementary in design and use similar material and finishes of the building being added to.	N/A
Finding: The subject property is developed with an existing single-family residence that was constructed in 1966 and is proposed to be demolished. While the existing structure is more than 50 years old, it is not designated on the City's adopted Historic Building/Site List. Review by the Historic Preservation Commission is not required; however, a demolition permit cannot be issued for the existing residence until a 60-day waiting period has concluded (KMC §15.16.040.B3) and a complete building permit application for a replacement project on the property has been accepted by the city and required fees have been paid (KMC §17.20.010.B).	

17.96.060.F.1 – Architectural	Conformance
Building(s) shall provide unobstructed pedestrian access to the nearest sidewalk and the entryway shall be clearly defined.	N/A
Finding: N/A. Ketchum Municipal Code 17.124.140 outlines the zone districts where sidewalks are required when substantial improvements are made, which include the Community Core, all tourist zone districts, and all light industrial districts. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for the project. This standard is not applicable.	

17.96.060.F.2 – Architectural	Conformance
The building character shall be clearly defined by use of architectural features.	YES
Finding: As stated previously, the proposed development utilizes a mountain modern design which utilizes clean lines, large windows, flat roof, and a mix of materials including wood, stone, concrete, and steel.	

17.96.060.F.3 – Architectural	Conformance
There shall be continuity of materials, colors and signing within the project.	YES
Finding: The project utilizes wood, steel, and stone siding materials and black trimmed windows throughout the project.	

17.96.060.F.4 – Architectural	Conformance
Accessory structures, fences, walls and landscape features within the project shall match or complement the principal building.	YES
Finding: No accessory structures or fences are proposed. The project proposes landscaping improvements that restore disturbed hillside areas. These landscaping improvements complement and soften the visual appearance of the single-family residence. The front, side, and rear yard setback areas will be restored and revegetated with native grasses. Shrubs are proposed along the sides of the residence, which will screen utilities and the avalanche retaining wall. New Evergreen, Aspen, and Russian Hawthorn trees will be installed to providing screening for the residence from adjacent properties.	

17.96.060.F.5 – Architectural	Conformance
Building walls shall provide undulation/relief, thus reducing the appearance of bulk and flatness.	YES
Finding: The proposed residence is three stories in height and each floor of the structure is stepped back into the hillside, providing undulation and relief. Additionally, the proposal features multiple wall and deck pop-outs to reduce the appearance of flatness.	

17.96.060.F.6 – Architectural	Conformance
Building(s) shall orient toward their primary street frontage.	YES
Finding: The residence is proposed to be oriented towards the primary street frontage along Sage Road.	

17.96.060.F.7 – Architectural	Conformance
Garbage storage areas and satellite receivers shall be screened from public view and located off alleys.	YES
Finding: No satellite receivers are proposed for the project. As shown on Sheet A201 of the architectural plans in Attachment B, the garage contains storage space to accommodate garbage bins. The garbage storage area will be contained within the enclosed garage and fully screened from public view.	

17.96.060.F.8 – Architectural	Conformance
Building design shall include weather protection which prevents water to drip or snow to slide on areas where pedestrians gather and circulate or onto adjacent properties.	YES
Finding: The roof plan indicates that metal gutters will be installed, and the roof will be sloped to downspouts, as shown on Sheet A204 of Attachment B. Further, the roof plan states that heat tape will be installed at all gutters and downspouts.	

17.96.060.G.1 – Circulation Design	Conformance
Pedestrian, equestrian and bicycle access shall be located to connect with existing and anticipated easements and pathways.	N/A
Finding: N/A. This project is located within the Sage Road area, an existing low-density residential neighborhood. The site is not contiguous to existing pedestrian, equestrian, or bicycle easements or pathways.	

17.96.060.G.2 – Circulation Design	Conformance
Awnings extending over public sidewalks shall extend five feet or more across the public sidewalk but shall not extend within two feet of parking or travel lanes within the right-of-way.	N/A
Finding: N/A. Ketchum Municipal Code 17.124.140 outlines the zone districts where sidewalks are required when substantial improvements are made, which include the CC, all tourist zone districts, and all light industrial districts. The subject property is located in the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.G.3 – Circulation Design	Conformance
Traffic shall flow safely within the project and onto adjacent streets. Traffic includes vehicle, bicycle, pedestrian and equestrian use. Consideration shall be given to adequate sight distances and proper signage.	YES
Finding: The proposal is for a residential development along a low traffic area on Sage Road. The City Engineer has reviewed the proposed driveway and finds its circulation design to meet city standards. Final circulation design shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.	

17.96.060.G.4 – Circulation Design	Conformance
Curb cuts and driveway entrances shall be no closer than 20 feet to the nearest intersection of two or more streets, as measured along the property line adjacent to the right-of-way. Due to site conditions or current/projected traffic levels or speed, the City Engineer may increase the minimum distance requirements.	YES
Finding: The proposed driveway is located further than 20 feet away from the nearest intersection of Sage Road and Lloyd Court.	

17.96.060.G.5 – Circulation Design	Conformance
Unobstructed access shall be provided for emergency vehicles, snowplows, garbage trucks and similar service vehicles to all necessary locations within the proposed project.	YES
Finding: Access for emergency vehicles, snowplows, and garbage trucks is provided along Sage Road.	

17.96.060.H.1 – Snow Storage	Conformance
Snow storage areas shall not be less than 30 percent of the improved parking and pedestrian circulation areas.	YES
Finding: Sheet L-1.0 shows the proposed snow storage areas to include a total of 989 square feet, greater than the required 30% (2,507 * .30 = 752 square feet).	

17.96.060.H.2 – Snow Storage	Conformance
Snow storage areas shall be provided on site.	YES
Finding: Sheet L-1.0 shows the locations of the snow storage areas on-site.	

17.96.060.H.3 – Snow Storage	Conformance
A designated snow storage area shall not have any dimension less than five feet and shall be a minimum of 25 square feet.	YES
Finding: Sheet L-1.0 shows that no snow storage area has dimensions less than five feet.	

17.96.060.H.4 – Snow Storage	Conformance
In lieu of providing snow storage areas, snowmelt and hauling of snow may be allowed.	YES
Finding: The applicant is proposing a driveway snowmelt system within the property boundary and not within the Sage Road right-of-way. In addition to the snowmelt system, the project is also proposing snow storage areas on-site.	

17.96.060.I.1 – Landscaping	Conformance
Landscaping is required for all projects.	YES
Finding: Landscaping has been provided for the project as indicated on Sheets L-1.0, L-1.1, L-2.0, L-3.0, and L-4.0 of the project plans.	

17.96.060.I.2 – Landscaping	Conformance
Landscape materials and vegetation types specified shall be readily adaptable to a site's microclimate, soil conditions, orientation and aspect, and shall serve to enhance and complement the neighborhood and townscape.	YES
Finding: The front, side, and rear yard setback areas will be restored and revegetated with native grasses. Shrubs and trees are proposed along the sides of the residence, which will screen utilities and the avalanche retaining wall. New native chokecherry trees will be installed to provide screening for utilities and new hackberry, spruce, and hawthorn trees will be installed to provide screening for the residence from adjacent properties. Maple trees are proposed in front of the residence to screen the structure from Sage Road. Boulders, ornamental grasses, vines, and perennials are also proposed around the structure.	

17.96.060.I.3 – Landscaping	Conformance
All trees, shrubs, grasses and perennials shall be drought tolerant. Native species are recommended but not required.	YES
Finding: The landscape plan proposes drought-tolerant and native species, including bristlecone pine and common hackberry trees, native shrubs, and drought tolerant grasses.	

17.96.060.I.4 – Landscaping	Conformance
Landscaping shall provide a substantial buffer between land uses, including, but not limited to, structures, streets and parking lots. The development of landscaped public courtyards, including trees and shrubs where appropriate, shall be encouraged.	YES
Finding: The proposal intends to provide landscaping on the front and side yards allowing for privacy between adjacent properties.	

17.96.060.J.1 – Public Amenities	Conformance
Where sidewalks are required, pedestrian amenities shall be installed. Amenities may include, but are not limited to, benches and other seating, kiosks, bus shelters, trash receptacles, restrooms, fountains, art, etc. All public amenities shall receive approval from the Public Works Department prior to design review approval from the Commission.	N/A
Finding: N/A. The subject property is located within the GR-L Zone, and sidewalks are not required to be installed for this project.	

17.96.060.K.1 – Underground Encroachments	Conformance
Encroachments of below grade structures into required setbacks are subject to subsection 17.128.020.K of this title and shall not conflict with any applicable easements, existing underground structures, sensitive ecological areas, soil stability, drainage, other sections of this Code or other regulating	N/A

codes such as adopted International Code Council Codes, or other site features concerning health, safety, and welfare.	
Finding: N/A. No encroachments of below grade structures are proposed.	

17.96.060.K.2 – Underground Encroachments	Conformance
No below grade structure shall be permitted to encroach into the riparian setback.	N/A
Finding: N/A. No encroachments of below grade structures are proposed, and the structure is not located within the riparian setback.	

City of Ketchum

Attachment F:

Mountain Overlay Design Review Standards Analysis

City of Ketchum
Planning & Building

406 Sage Road
MOUNTAIN OVERLAY DESIGN REVIEW STANDARDS ANALYSIS

Mountain Overlay Design Review Standards (KMC §17.104.070.A)				
Compliant			Standards and Findings	
Yes	No	N/A	Ketchum Municipal Code	City Standards and Findings
☒	☐	☐	17.104.070.A.1	There is no building on ridges or knolls which would have a material visual impact on a significant skyline visible from a public vantage point entering the City or within the City. Material, as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this Ordinance.
			Findings	The project is not sited on a ridge or knoll that would have a material visual impact on a significant skyline visible from a public vantage point entering or within the city. The proposed residence is sited at the lower elevation of the parcel preserving the natural topography of the hillside above.
☒	☐	☐	17.104.070.A.2	Building, excavating, filling and vegetation disturbance on hillsides which would have a material visual impact visible from a public vantage point entering the City or within the City is minimized. Material, as the term is used herein, shall be construed in light of the magnitude of the negative impact on the objectives of this Ordinance.
			Findings	As the proposal occurs at the lower elevation of the subject property, all building, excavating, filling and vegetation disturbance will not occur at a point on the hillside which has a material visual impact visible from a public vantage point.
☒	☐	☐	17.104.070.A.3	Driveway standards as well as other applicable standards contained in Street Standards Chapter 12.04 are met.
			Findings	The proposed driveway improvements have been reviewed by the City Engineer, Streets Department, and Fire Department. The driveway improvements comply with all applicable standards for private driveway specified in Ketchum Municipal Code §12.03.030.L. If approved, the applicant shall submit final civil drawings prepared by an engineer registered in the State of Idaho that provide specifications for the proposed driveway and right-of-way improvements for final review and approval by the City Engineer and Streets Department prior to issuance of a building permit for the project.
☒	☐	☐	17.104.070.A.4	All development shall have access for fire and other emergency vehicles to within one hundred fifty feet (150') of the furthest exterior wall of any building.
			Findings	Sufficient access is provided for fire and other emergency vehicles to reach within 150 feet of the furthest exterior wall of the building. The

				Fire Department has reviewed the project plans and has found that all access requirements for emergency vehicles have been met. Emergency vehicle access shall be reviewed and approved by the Fire Department prior to issuance of a building permit.
☒	☐	☐	17.104.070.A.5	Significant rock outcroppings are not disturbed.
			Findings	There are no significant rock outcroppings within the property boundary of the subject property
☒	☐	☐	17.104.070.A.6	International Building Code (IBC) and International Fire Code (IFC) and Ketchum Fire Department requirements shall be met.
			Findings	The project must comply with the 2018 International Residential Code, the 2018 International Fire Code, all local amendments specified in Title 15 of Ketchum Municipal Code, and Ketchum Fire Department requirements. All building code, fire code, and Fire Department requirements will be verified for compliance by the Building and Fire departments prior to building permit issuance.
☒	☐	☐	17.104.070.A.7	Public water and sewer service comply with the requirements of the City.
			Findings	As shown on C1.0 of the project plans, the applicant is proposing to abandon the existing well service and connect to the municipal water and sewer systems from existing lines within Sage Road. Requirements and specification for the water and sewer connections will be verified, reviewed, and approved by the Utilities Departments prior to issuance of a Building Permit for the project.
☒	☐	☐	17.104.070.A.8	Drainage is controlled and maintained to not adversely affect other properties.
			Findings	Pursuant to KMC §17.96.060.C.1, all storm water drainage shall be retained on site. Drainage improvements are specified on Sheet C1.0 of the project plans in Attachment B. The drainage improvements include the installation of a trench drain bordering the width of the driveway. A combination of drywells and catch basins will be installed to collect stormwater from the rest of the property. The City Engineer has reviewed the proposed drainage plan and believes the trench drain and drywell improvements are sufficient to maintain all storm water drainage on-site. All drainage plans and specifications shall be reviewed and approved by the City Engineer and Streets Department prior to issuance of a Building Permit for the project.
☒	☐	☐	17.104.070.A.9	Cuts and fills allowed for roadways shall be minimized; lengths of driveways allowed shall be minimized; all cuts and fills shall be concealed with landscaping, revegetation and/or natural stone materials. Revegetation on hillsides with a clear zone of thirty feet (30') around all structures is recommended. Said clear zone shall include low

				combustible irrigated vegetation with appropriate species, on file with the Ketchum planning department. Revegetation outside of this clear zone should be harmonious with the surrounding hillsides.
			Findings	The proposed residence is sited slightly above the minimum front yard setback at 15'-2 ½". The proposed driveway on Sage Road is 20 feet in width. The landscape plan proposes a variety of drought tolerant trees, shrubs, and grasses that will conceal any cuts and fills the project has. The Fire Department has reviewed the project plans and recommended a 26-foot aerial fire apparatus access road for the project, which is proposed in the project plans. Fire Protection Ordinance No. 1217 (KMC §15.08.080) requires that: (1) tree crowns extending within 10 feet of any structure shall be pruned to maintain a minimum horizontal clearance of 10 feet, (2) tree crowns within 30 feet of any structure shall be pruned to remove limbs less than 6 feet above the ground surface adjacent to trees, and (3) non-fire resistive vegetation or growth shall be kept clear of buildings and structures in order to provide a clear area for fire suppression operations. The project complies with the fire protection and defensible space standards specified in KMC §15.08.080. The Fire Department is not requiring a driveway snowmelt system for the project.
☒	☐	☐	17.104.070.A.10	There are not other sites on the parcel more suitable for the proposed development in order to carry out the purposes of this Ordinance.
			Findings	The proposed residence is situated just slightly above the minimum required front yard setback (of 15') at 15'-2 ½". The applicant is proposing to demolish the existing single-family residence and retain the existing configuration of the property. Therefore, subsection B of the Planning and Zoning Commission's Zoning Code Interpretation 22-001 (Attachment I) is applicable to the project. This requires the project to demonstrate that the project does not exceed the height or limits of disturbance of the existing nonconforming home. Staff believes that to comply with criteria #10, more compliant and suitable locations for development are those outside of 25% or greater slopes, particularly when a site is previously disturbed. Currently, the existing nonconforming single-family residence on the property is located outside of the 25% slope. However, due to the grading lines on the site survey (Figure 3), it appears that the entire lot was previously within 25% slope and was graded for the construction of the existing structure on the lot. The proposed development differs by increasing the disturbance into the 25% slope area of the lot. No portion of the proposed residence will

				encroach into the 25% slope area. However, 396 square feet of disturbance into the hillside is proposed for the structure's construction. This disturbance is not reflected in the current plan set, as staff had brought it to the applicant's attention that the existing limits of disturbance diagram on Sheet A200C of Attachment B had not accurately reflected the site survey. The applicant informed staff that an outdated site survey had been used and sent staff a revised Sheet A200C which increased the proposed limits of disturbance from 254 square feet to 396 square feet. The MOD does encourage development to be sited down on the hillside, which the proposed residence does by having just slightly above the minimum required front yard setback. However, as the development uses more of the western portion of the lot, the development does see encroachment into the 25% slope area. In previous Mountain Overlay applications, the Commission has been supportive of minor encroachments into the 25% slope area for permanent structures. The project is proposing temporary encroachment into the 25% slope for construction that would be reclaimed following completion of the project. Therefore, staff is supportive of the proposed temporary encroachment into the hillside.
☒	☐	☐	17.104.070.A.11	Access traversing 25% or greater slopes does not have significant impact on drainage, snow and earth slide potential and erosion as it relates to the subject property and to adjacent properties.
			Findings	No access traversing 25% or greater slopes is proposed.
☒	☐	☐	17.104.070.A.12	Utilities shall be underground.
			Findings	The utility improvements are indicated on Sheet C1.0 of the project plans. The project will utilize sewer, gas, and electrical service from Sage Road. The Utilities Department reviewed the project plans and the service connections for compliance with city requirements. Pursuant to condition of approval #2, the applicant shall submit final civil drawings prepared by an engineer registered in the State of Idaho that provide specifications for the proposed utility improvements for final review and approval by the Utilities Department prior to issuance of a building permit for the project.
☒	☐	☐	17.104.070.A.13	Limits of disturbance shall be established on the plans and protected by fencing on the site for the duration of construction.
			Findings	Sheet C1.0 shows the proposed limits of disturbance on the subject property for the proposed residence. A construction management plan that addresses all construction activity standards specified in Ketchum Municipal Code §15.06.030 will be required to be submitted with the building permit application. City Departments will conduct a comprehensive review of the proposed construction management plan during plan review for the building permit.

☒	☐	☐	17.104.070.A.14	Excavations, fills and vegetation disturbance on hillsides not associated with the building construction shall be minimized.
			Findings	The project minimizes building, excavating, filling, and vegetation disturbance by containing all construction activity within a majority of the existing disturbed area on the subject property. The proposed cut and fill quantities are specified on Sheet C4.0. The total volume of the proposed cut is 2057.7 cubic yards. The proposed fill comes out to 83.7 cubic yards. The proposed residence is sited at the lower elevation of the parcel, which preserves the natural topography of the hillside above. Additionally, the project proposes to further preserve the hillside by restoring and revegetating existing disturbed areas within the rear and side yard setback areas.
☐	☐	☒	17.104.070.A.15	Preservation of significant landmarks shall be encouraged and protected, where applicable. A significant landmark is one which gives historical and/or cultural importance to the neighborhood and/or community.
			Findings	No significant landmarks have been identified on-site.
☐	☐	☒	17.104.070.A.16	Encroachments of below grade structures into required setbacks are subject to subsection 17.128.020.K of this title and shall not conflict with any applicable easements, existing underground structures, sensitive ecological areas, soil stability, drainage, other sections of this Code or other regulating codes such as adopted International Code Council Codes, or other site features concerning health, safety, and welfare.
			Findings	This standard is not applicable as the project does not propose below-grade structures that encroach into required setbacks.

City of Ketchum

Attachment G:

Zoning and Dimensional Standards Analysis

City of Ketchum
Planning & Building

406 Sage Road
COMPLIANCE WITH ZONING REGULATIONS

Compliance with Zoning and Dimensional Standards				
Compliant			Standards and Findings	
Yes	No	N/A	Ketchum Municipal Code	City Standards and Findings
☒	☐	☐	17.12.030	Minimum Lot Area
			Finding	**Required:** 8,000 square feet **Existing:** 136,408 square feet (3.13 acres)
☒	☐	☐	17.12.030	Building Coverage
			Finding	**Permitted:** 35% **Proposed:** 2.7% (3,692 square feet building coverage / 136,408 square feet lot area)
☒	☐	☐	17.12.030	Minimum Building Setbacks
			Finding	Minimum Required Setbacks: Front: 15' Side: > of 1' for every 3' in building height, or 5' (13'-4" required) Rear: > of 1' for every 3' in building height, or 15' (13'-4" required) Proposed: Front (Sage Road/east): 15'-2½" Side (south): 13'-4 3/4" Side (north): 13'-6 3/4" Rear (west): 1,023'
☒	☐	☐	17.12.030	Building Height
			Finding	**Maximum Permitted:** 35' (properties which step up or down hillsides may extend 5 feet above the maximum height permitted in the zoning district) **Proposed:** 39'-6"
☒	☐	☐	17.125.030.H	Curb Cut
			Finding	Permitted: A total of 35% of the linear footage of any street frontage can be devoted to access off street parking. **Proposed:** 16% (20-foot-wide driveway/127.82 feet of property frontage along Sage Road).
☒	☐	☐	17.125.020.A.2 & 17.125.050	Parking Spaces
			Finding	Off-street parking standards of this chapter apply to any new development and to any new established uses. Required:

				Residential (one family dwelling), in all applicable zoning districts require two parking spaces. Proposed: The project proposes three parking spaces within the enclosed garage.

City of Ketchum

Attachment H:

Conditional Use Permit Standards Analysis

City of Ketchum
Planning & Building

406 Sage Road

CONDITIONAL USE PERMIT CRITERIA

Conditional Use Requirements				
EVALUATION STANDARDS: 17.116.030 and § 67-6512 of Idaho Code A conditional use permit shall be granted by the commission only if the applicant demonstrates the following:				
Compliance and Analysis				
Yes	**No**	**N/A**	**City Code**	**City Standards and *Staff Comments***
☒	☐	☐	**17.116.030(A)**	**The characteristics of the conditional use will not be unreasonably incompatible with the types of uses permitted in the applicable zoning district.**
			Staff Comments	The project is proposing a conditional use avalanche retaining wall to the rear of the residence. The function of the conditional use avalanche wall is to protect the proposed structure, adjacent structures, and to prevent snow from sliding onto the Sage Road right-of-way. Staff finds the proposed conditional use avalanche protective structure for the project to be compatible with the zoning district, as other conditional use avalanche protective structures have been permitted on Sage Road, including the adjacent townhomes at 400 and 402 Sage Road (File No. P22-070A), and in the surrounding neighborhood.
☒	☐	☐	**17.116.030(B)**	**The conditional use will not materially endanger the health, safety and welfare of the community.**
			Staff Comments	As previously mentioned, the function of the conditional use avalanche wall is to protect the proposed structure, adjacent structures, and to prevent snow from sliding onto the Sage Road right-of-way. The applicant submitted a site-specific avalanche study and avalanche wall plans designed by a structural engineer to withstand the anticipated forces. The wall's exposed height is 24' above grade and it is located perpendicular to the projected avalanche flow to not deflect avalanches onto adjacent properties or damage/endanger persons or property in the vicinity of the project.
☒	☐	☐	**17.116.030(C)**	**The conditional use is such that pedestrian and vehicular traffic associated with the use will not be hazardous or conflict with existing and anticipated traffic in the neighborhood.**
			Staff Comments	The proposed development is platted within the Warm Springs Village Subdivision, Fourth Addition that was recorded in 1961. The subject property was identified as being within an Avalanche Zone by the City of Ketchum in 1979. The proposed conditional use avalanche protective wall will not be hazardous or conflict with existing and

				anticipated traffic in the neighborhood. A function of the avalanche protective wall is to prevent snow from sliding onto the Sage Road right-of-way.
☒	☐	☐	**17.116.030(D)**	**The conditional use will be supported by adequate public facilities or services and will not adversely affect public services to the surrounding area or conditions can be established to mitigate adverse impacts.**
			Staff Comments	As mentioned above, all departments have reviewed the proposed conditional use including streets, fire, water, wastewater, planning and engineering. The conditional use permit is for the structure's avalanche protective wall. Avalanche protective walls do not require public facilities or services.
☒	☐	☐	**17.116.030(E)**	**The conditional use is not in conflict with the policies of the Comprehensive Plan or the basic purposes of this section.**
			Staff Comments	The community's core values in the City of Ketchum's 2014 Comprehensive Plan include protecting the community character of Ketchum and preserving its environmental quality and scenic beauty. Ketchum's undeveloped hillsides are visual assets that define the character of our community. Protecting and preserving Ketchum's natural resources is critical to maintaining our economy, quality of life, and community identity. Staff believes that the goals and policies of the comprehensive plan related to hillside development are met with the proposed project as the single-family residence is within the list of primary uses anticipated in the future land use category and due to the location of the structure sited at the lower elevation of the lot and has a front yard setback of 15'-2 ½" which is just slightly above the minimum front yard setback of 15' to cause minimal impact on the visual character of the hillside.

City of Ketchum

Attachment I:

Planning and Zoning Commission Zoning Code Interpretation 22-001

City of Ketchum
Planning & Building

KETCHUM PLANNING AND ZONING COMMISSION
ZONING CODE INTERPRETATION 22-001
NONCONFORMING BUILDING FOOTPRINTS IN MOUNTAIN OVERLAY

INTERPRETATION QUESTION

This zoning code interpretation addresses redeveloping nonconforming properties within the Mountain Overlay. Current code requires new buildings to be constructed in areas that have less than 25% slope (Ketchum Municipal Code §16.04.020) and building envelopes on new parcels to be located outside of a 25% slope. Existing homes on hillsides that were developed prior to the City's establishment of the Mountain Overlay Zoning District in 1989 may not comply with current development standards. These homes are considered non-conforming buildings and may be maintained in their current condition. Nonconforming buildings and uses are governed under Chapter 17.136 of Ketchum Municipal Code. If a non-conforming structure is demolished, or a new parcel is created, then the new building and parcel must comply with all current development standards. Certain non-conforming building footprints and properties can not be brought into compliance with code. The fundamental question before the Commission was whether these non-conforming properties may be developed with a new home or if these non-conforming properties would not be permitted to be redeveloped if the existing non-conforming home were to be demolished. If redevelopment was prohibited, property owners would only be able to repair, maintain, and enlarge their existing nonconforming homes in accordance with the standards specified in Chapter 17.136 of Ketchum Municipal Code.

MOUNTAIN OVERLAY PURPOSE

Hillside development standards protect the community character and health and safety by ensuring the adequate provision of public services and facilities, including fire protection. The Mountain Overlay standards prohibit the detrimental alteration of hillside that would adversely impact existing soils, drainage, and vegetation. The undeveloped hillsides surrounding Ketchum are one of Ketchum's character-defining features. The Mountain Overlay Zoning District ensures the preservation of these hills, ridgelines, and natural features. The standards minimize the visual impact of development by directing building sites away from higher elevations and keeping hillsides open and unobstructed.

ZONING NONCONFORMITIES

Nonconformities are existing uses, buildings, lots, or site features that were legally established at the time they were created but no longer comply with current zoning code regulations. When land use regulations change, existing developments may not comply with the amended zoning code standards. Requiring owners to immediately bring their non-conforming buildings and uses into compliance following land use regulation changes would be a hardship. To mitigate this hardship, zoning codes set specific standards to address nonconformities. These standards generally allow owners to maintain nonconformities in their current condition but prohibit or limit substantial modifications and expansions. This approach assumes all nonconformities will

be phased out over time. Standards regulating zoning nonconformities balance the community's interests in new land use objectives with private property interests in existing development.

ZONING CODE INTERPRETATION IMPLICATIONS: HILLSIDE DISTURBANCE

Redeveloping nonconforming building footprints may result in even more disturbance to the hillside. New single-family homes in Ketchum have trended towards replacing existing, smaller buildings with larger structures, which would have a greater impact on the hillside. Redeveloping these nonconforming properties to comply with current City building, fire, zoning, and streets standards could result in more hillside disturbance. For example, widening an existing street that accesses a nonconforming property would result in significantly more disturbance to the hillside.

ZONING CODE INTERPRETATION IMPLICATIONS: VISIBILITY ON HILLSIDES

Many non-conforming buildings in the Mountain Overlay are sited on prominent ridgelines and hilltops and are highly visible. Allowing these non-conforming building footprints to be redeveloped with new homes would perpetuate a condition that is no longer allowed.

PLANNING AND ZONING COMMISSION INTERPRETATION

The Commission determined that the redevelopment of existing non-conforming properties may be redeveloped under the following conditions:

A. If the property configuration is proposed to be modified (lot line adjustment, lot consolidation etc.), then the new property configuration must establish a building envelope on the lowest portion of the property. Existing non-conforming building footprints are not permitted to be redeveloped outright. If a more compliant alternative at a lower elevation on the hillside property exists, the new home must be sited in the more suitable area for redevelopment.

B. If the property configuration is not being altered or changed, then a new home may be constructed at the Commission's discretion through Mountain Overlay Design Review provided that the project does not exceed the height or limits of disturbance of the existing non-conforming home. The building footprint shall conform as close as possible to the existing building.

This determination will apply to all existing non-conforming properties in hillside areas.

Zoning Code Interpretation adopted this 8th day of March 2022.

Neil Morrow, Chair
City of Ketchum
Planning and Zoning Commission

City of Ketchum

Attachment J:

Public Comment

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Rd
Date: Friday, June 30, 2023 10:24:41 AM

PC

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****Please sign up for the NEW Planning and Building quarterly newsletter. Click HERE and select "Planning and Development"**

From: Julie gulick <jkgulick@comcast.net>
Sent: Thursday, June 29, 2023 1:15 PM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Rd

Hello,

Our names are Julie and Tad Gulick. We live at 420 Huffman Dr, Ketchum. We have reviewed the application for 406 Sage Rd and we support the project as presented.

Sincerely,

Julie and Tad Gulick

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Road
Date: Friday, June 30, 2023 10:25:04 AM

Another PC for you.

HEATHER NICOLAI | CITY OF KETCHUM
Planning Technician & Office Administrator
P.O. Box 2315 | 191 Fifth St. W. | Ketchum, ID 83340
o: (208) 727-5072
planningandzoning@ketchumidaho.org
hnicolai@ketchumidaho.org | www.ketchumidaho.org
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From: Vanessa Herbert <vherbert@cox.net>
Sent: Thursday, June 29, 2023 10:03 PM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road

To whom it may concern:

My name is Vanessa Herbert and I am the owner of 3016 Warm Springs Road. I would like to express my support for the application and beautiful proposed project at 406 Sage Road. I have reviewed the 406 Sage Road application, am in complete support of the project as presented and believe it will be a great improvement to the neighborhood.

Thank you,
Vanessa Herbert

Vanessa Herbert | vherbert@cox.net

From:	Heather Nicolai
To:	Paige Nied
Subject:	FW: 406 Sage Road
Date:	Wednesday, July 5, 2023 1:48:03 PM

Another one for you.

HEATHER NICOLAI | CITY OF KETCHUM

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From: Participate <participate@ketchumidaho.org>
Sent: Wednesday, July 5, 2023 1:45 PM
To: Heather Nicolai <HNicolai@ketchumidaho.org>
Subject: FW: 406 Sage Road

LISA ENOURATO | CITY OF KETCHUM

Public Affairs & Administrative Services Manager

P.O. Box 2315 | 191 Fifth St. W. | Ketchum, ID 83340

o: 208.726.7803 | f: 208.726.7812

lenourato@ketchumidaho.org | www.ketchumidaho.org

From: Brad Green <bd@paladinnw.com>
Sent: Monday, July 3, 2023 5:47 PM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road

My name is Brad Green I live at Warm Springs Ranch,
I have reviewed the 406 Sage Road application and I support this project as presented.

Brad Green
425.466.3500
bd@paladinnw.com

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Road Application
Date: Friday, June 30, 2023 10:24:26 AM

More PC for you!

HEATHER NICOLAI | CITY OF KETCHUM
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-----Original Message-----
From: Dave Arbanas <davearbanas@icloud.com>
Sent: Wednesday, June 28, 2023 3:22 PM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road Application

My name is Dave Arbanas and I live at 100 Georginia Road in Ketchum. I have reviewed the application for 406 Sage Road and I am in support of the project. I have known Brian Poster for over 25 years and I am confident the project will be an enhancement to the Warm Springs community.

Respectfully,

Dave Arbanas

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 SAGE ROAD SINGLE FAMILY RESIDENCE
Date: Wednesday, July 5, 2023 11:56:42 AM

PC for you!

HEATHER NICOLAI | CITY OF KETCHUM
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From: Participate <participate@ketchumidaho.org>
Sent: Monday, July 3, 2023 9:44 AM
To: Heather Nicolai <HNicolai@ketchumidaho.org>
Subject: FW: 406 SAGE ROAD SINGLE FAMILY RESIDENCE

LISA ENOURATO | CITY OF KETCHUM
Public Affairs & Administrative Services Manager
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o: 208.726.7803 | f: 208.726.7812
lenourato@ketchumidaho.org | www.ketchumidaho.org

From: Gregory Blume <gregorygblume@gmail.com>
Sent: Sunday, July 2, 2023 10:53 AM
To: Participate <participate@ketchumidaho.org>
Subject: 406 SAGE ROAD SINGLE FAMILY RESIDENCE

My name is Greg Blume, I live at 115 Townhouse Lane #11 in Warm Springs. I have reviewed the 406 Sage Road application and I support this project as presented. Thank you. GGB

Gregory G. Blume
Blume Investment Company
P.O. Box 3912
Ketchum, ID 83340
(206) 817-7441

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Road
Date: Friday, June 30, 2023 10:24:13 AM
Attachments: image001.png

PC for you!

HEATHER NICOLAI | CITY OF KETCHUM
Planning Technician & Office Administrator
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From: Doug Waddell <doug@waddellpropertiesinc.com>
Sent: Wednesday, June 28, 2023 11:16 AM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road

Hello – my name is Doug Waddell and we own a townhome at 3020 Warm Springs Road Unit B, and previously owned at 161 Simpson in Warm Springs for over 20 years. I have reviewed the plans for the new house at 406 Sage Road (Pratt Residence) and fully support it. It will be a dramatically positive improvement compared to what is currently there, and I like how it contours from the flatter lower part of the site and then terraces up. In particular, I like the natural materials proposed, the color pallet, landscape plan and the concrete and steel planters. It is a beautifully designed new residence and I recommend approval.

WADDELL PROPERTIES INCORPORATED

Doug Waddell
Waddell Properties, Inc.

A 13 Central Way, Suite C Kirkland, WA 98033
O (425) 822-3021 **M** (206) 300–2599
E doug@waddellpropertiesinc.com
W www.wpapartment.com

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Road
Date: Wednesday, June 28, 2023 10:47:48 AM

More Public Comment for you!

HEATHER NICOLAI | CITY OF KETCHUM
Planning Technician & Office Administrator
P.O. Box 2315 | 191 Fifth St. W. | Ketchum, ID 83340
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planningandzoning@ketchumidaho.org
hnicolai@ketchumidaho.org | www.ketchumidaho.org
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From: jrs@jsfaia.com <jrs@jsfaia.com>
Sent: Wednesday, June 28, 2023 9:22 AM
To: Participate <participate@ketchumidaho.org>
Cc: brian@poster-construction.com
Subject: 406 Sage Road

To Whom it may Concern,
My name is Jack Smith. I am a local architect with offices in Ketchum. I have been a permanent resident of Idaho since 1974. I have been on design review boards and I was a commissioner on the Ketchum Planning Commission. I have reviewed the drawings and renderings for the proposed new residence on 406 Sage Road and find them to be excellent and highly appropriate. This new design will enhance the neighborhood in its aesthetic appeal.
Thank you for your consideration.
Jack Smith FAIA, Arch D.

ARCHITECT JACK SMITH FAIA
jrs@jsfaia.com
208-720-3653
www.jacksmitharchitect.com

From: Heather Nicolai
To: Paige Nied
Subject: FW: Brian Poster request
Date: Tuesday, June 27, 2023 1:59:42 PM

Paige - PC for your Sage Road project.

HEATHER NICOLAI | CITY OF KETCHUM
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-----Original Message-----
From: LEROY KINGLAND <lkingland@aol.com>
Sent: Tuesday, June 27, 2023 12:49 PM
To: Participate <participate@ketchumidaho.org>
Subject: Brian Poster request

Gentlemen!
My name is LeRoy Kingland,
Live at 3014B Warm Springs Rd.
Ketchum, Idaho 83340
206-953-7445
Box 801, Ketchum.
I have reviewed Mr.Posters application, and I give my approval for the project on Sage road dated 6-27-2023
Signed, LeRoy Kingland

Sent from my iPhone

From: Planning and Zoning
To: Paige Nied
Subject: FW: 406 Sage Road
Date: Tuesday, June 27, 2023 2:09:18 PM

Another PC for you!

HEATHER NICOLAI | CITY OF KETCHUM
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****Please sign up for the NEW Planning and Building quarterly newsletter. Click HERE and select "Planning and Development"**

From: Mickey Smith <hmsmith@martinsmith.com>
Sent: Tuesday, June 27, 2023 11:35 AM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road

My name is Martin Smith and I have a home at 392 Sage Road, near the proposed project at 406 Sage Road.
I fully support this project as presented.

Martin Smith
392 Sage Road
Ketchum ID 83340
206 817-8292

From: Planning and Zoning
To: Paige Nied
Subject: FW: 406 Sage Rd
Date: Tuesday, June 27, 2023 2:09:01 PM

More PC for you

HEATHER NICOLAI | CITY OF KETCHUM
Planning Technician & Office Administrator
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From: rich ketchumkustomwoodworks.com <rich@ketchumkustomwoodworks.com>
Sent: Tuesday, June 27, 2023 10:27 AM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Rd

My Name Richard Evans and I live 320 West 7th St in Ketchum, Idaho

I have reviewed the 406 Sage Road and we support this project as presented.

Thx

Richard Evans

From: Heather Nicolai
To: Paige Nied
Subject: FW: 406 Sage Road
Date: Tuesday, June 27, 2023 2:05:58 PM

PC for you!

HEATHER NICOLAI | CITY OF KETCHUM
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hnicolai@ketchumidaho.org | www.ketchumidaho.org

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From: Participate <participate@ketchumidaho.org>
Sent: Tuesday, June 27, 2023 2:02 PM
To: Heather Nicolai <HNicolai@ketchumidaho.org>
Subject: FW: 406 Sage Road

Public comment.

LISA ENOURATO | CITY OF KETCHUM
Public Affairs & Administrative Services Manager
P.O. Box 2315 | 191 Fifth St. W. | Ketchum, ID 83340
o: 208.726.7803 | f: 208.726.7812
lenourato@ketchumidaho.org | www.ketchumidaho.org

From: WAYNE E ALLEN <wayneeallen@msn.com>
Sent: Tuesday, June 27, 2023 1:35 PM
To: Participate <participate@ketchumidaho.org>
Subject: 406 Sage Road

My nameis Wayne Allen. My wife, Kelly, and I own and live at 310 Huffman Drive in Ketchum. We have reviewed the 406 Sage Road application and we support this application as presented.

Thank you for your consideration. Wayne and Kelly Allen.