G / A

GUTIERREZ / ASSOCIATES ARCHITECTS

2023

FORT BRAGG MAIN STREET FIRE STATION
STRUCTURAL + ARCHITECTURAL ANALYSIS

G / A

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April 5, 2023

PROJECT

Fire Station Rehabilitation Project at 141 North Main Street

SUBJECT

Fort Bragg Main Street Fire Station

REFERENCES

Exhibit A 2007 Facility Master Plan, Exhibit B 2009 Geotechnical, and Exhibit C Main Street Fire Station Seismic Evaluation

PROJECT RECOMMENDATION SUMMARY

Methodology for Analysis:

After reviewing all documents, 2007 Public Facility Master Plan, 2009 Fire Station Geotechnical Report, 2009 Fire Station Seismic Evaluation, G/A's goal is to verify the results of the report. Assessments of the buildings were recorded through the following means;

1. G/A and Covenant Engineer's Site Visit of current conditions
2. Structural Model Calcs from report's recommendations of structural upgrades
3. Renovation Cost Estimate
4. New Construction Cost Estimate
5. The building that performs structurally the worse, governs the criteria for upgrades of the other buildings

Exceptions to this report include;

1. Current conditions of the Station based are on listed reports deficiencies
2. Investigations of Site did not include exploratory demolition to expose covered areas of degradation
3. Recommendations by G/A are based on the limited information provided and experience with buildings of a similar nature.
4. G/A and its consultants used a means of cost estimating based on known conditions and cost estimating by RS Means and G/A's other cost estimates in a similar type.

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EVALUATION

Structural:

The most critical of renovation work to attempt to bring the building to a current level of Essential Facility is based on Structural Recommendations. The following is an analysis from Covenant Engineers to include summary letter. Calculations at the culmination of the report.

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Covenant Engineering
"WHEN INTEGRITY COUNTS..."

Ft. Bragg Fire Station (E) Structures
Ft. Bragg, CA

EXISTING STRUCTURES EVALUATION

To: Gutierrez Associates
Attn: Efren Gutierrez
315 14th St., 2nd Flr
Oakland, CA 94612

Re: Ft. Bragg Fire Station
(E) Structures Evaluation
141 N Main St.
Ft. Bragg, CA 95437

Date: April 3, 2023

Dear Efren,

This letter is being provided as a summary of our structural evaluation regarding the adequacy of the existing structures as related to site-specific structural demands for Risk Category IV essential facilities structures.

A preliminary review of the structural systems identified expected weaknesses in the lateral force resisting systems (LFRS), which are those structural components intended to resist loads resulting from wind and seismic sources. It was quickly determined that seismic forces would be of more significance than wind. Accordingly, our evaluation focused on the seismic demand relative to the capacity of these lateral structural components.

Briefly, different LFRS are rated seismically based on their ability to dissipate the anticipated lateral energy. Greater ability of a system to dissipate seismic energy correlates to a higher 'R_{EQ}' value and a relatively lower seismic demand, whereas conversely a lower 'R_{EQ}' value correlates to lesser dissipation of lateral energy and relatively higher seismic demands.

The understanding of seismic risks associated with geographic locations have advanced in the years since Welty 2010. The most important site-related seismic value which affects seismic demand is the Short Period Design Spectral Response 'S_{DS}'. The current seismic 'S_{DS}' value (without the benefit of a current soils report) is 20.4% higher than those reported in the Welty 2010 plans. *(See TABLE 1)*.

Additionally, there appears to be some discrepancy in the determination of the effective seismic mass of each structure. Without the benefit of having the supporting structural calculations from Welty 2010, a direct analysis of the Welty 2010 reported base shear is not practical. Accordingly, the undersigned has used presumptive weights of construction assemblies based on experience as well as the site walk-through and visual inspection of to derive the effective seismic mass used for this evaluation.

Beyond the increase in seismic site criteria, the greatest single factor affecting the adequacy of the existing lateral systems to current code demand not just for essential facilities, but generally, is the inter-connectivity of the three structures. ASCE 7-16 § 12.2.3 requires the worst-case seismic load effects (translated = lowest 'R_{EQ}' value and corresponding worst-case seismic loading scenario) to be used for all systems where different LFRS are used in the same direction. Due to the connectivity at the joining of the Administration building to both the North and South Wings, the worst-case seismic load effects are therefore required to be used throughout *all* the lateral systems on *all* buildings in both directions when performing a lateral analysis of the existing structures in their current state.

An appropriate attempt at remediation is to separate the different LFRS so that they may act independently. Details 7 & 8 on sheet S4 of the Welty 2010 plans attempted to address this, but appear to be inadequate insofar as complete isolation of the differing seismic systems is concerned. By way of example, nothing in Welty 2010 plans appears to address separation and isolation of the 2-story structure LFRS components.

Isolation of the North Wing would be an appropriate first step in improving the independence and resulting adequacy of the varying LFRS systems. This step, however, would require at a ***minimum*** something similar to Welty 2010, but would likely justify something more akin to a full rebuild of the wood stud wall adjacent to the North Wing masonry wall, with an appropriately-sized gap or void between the two walls to avoid conflicts during a seismic event. *(Any isolated gap construction similar to Welty 2010 would likely create additional maintenance concerns of adequately sealing any such gaps or joints to prevent the intrusion of water, which would become a continual and cumbersome maintenance issue.)*

To further exacerbate the LFRS system isolation issue, the Administration and South Wing structures currently share a common stud wall which acts as both a bearing wall and a shear wall. Welty 2010 attempted to provide a separation in order to isolate the N-S LFRS Administration and South Wing systems, but again provided no separation at the 2-story structure. Nor is there any break in the continuity of the outer perimeter N-S wood shearwalls where the Administration and South Wing structures abut. This lack of full separation would thus require the entire N-S LFRS for both the Administration and South Wing structures to rely on the lesser 'R_{EQ}' value corresponding to the ordinary steel moment frames of the South Wing. Again, difficulties arise with providing at a minimum an adequate seismic gap similar to those previously described for the Administration and North Wing separation.

A brief summary of the vertical and lateral structural systems for each of the buildings are as follows:

NORTH WING
- Vertical - site-built wood truss roof on girder framing o/concrete piers & ledgered to masonry bearing walls
- Lateral – ordinary reinforced masonry shearwalls (R_{EQ} = 2.0)

ADMINISTRATION
- Vertical – manufactured wood trussed roof & wood framed floor supported by wood stud walls
- Lateral – light-framed wood shearwalls (R_{EQ} = 6.5)

SOUTH WING
- Vertical – wood 2x rafters o/interior steel W14x43 stl beams & perimeter 2x stud bearing walls
- Lateral (E-W) – light-framed wood shearwalls (R_{EQ} = 6.5)
- Lateral (N-S) – ordinary steel moment frames (R_{EQ} = 3.5)

A brief summary of identified strengths and/or weakness of each of the existing structures are as follows:

NORTH WING
- Surprisingly, the bulk of the North Wing is the most satisfactory of all the LFRS, due primarily to the relatively high shear capacity and large shear areas. The highest masonry block shear stress is well under 50 psi, which is well within the capacity of typical fully grouted masonry block units.
- The greatest weaknesses occur with the front concrete moment frames and out-of-plane anchorage of the masonry block walls to the roof diaphragms. The material age also raises questions of suitability when subjected to high seismic forces. Due to the age, condition and type of this existing lateral system at the front wall line of the North Wing, both Welty 2010 and the undersigned appear to agree that reliance on this existing concrete moment frame is unwise.

ADMINISTRATION
- The vertical framing appears to be substantially satisfactory for anticipated floor and roof vertical demands.
- The lateral systems appear to be significantly insufficient insomuch that important components critical for the proper function of light-framed shearwalls (i.e. hold-downs & straps) are likely missing for even the best-case mitigation conditions where seismic separation is provided at both the North and south Wing adjoining walls. Where no seismic separation joints are provided, the shearwalls are clearly inadequate, as the shearwall demands exceed most reasonable light-framed wood shearwall capacities in nearly every shearwall section, and hold-down forces reach unreasonable levels.

SOUTH WING

- The wood-framed roof members appear to be adequate for vertical roof demands.
- The steel moment frame is significantly over-stressed for current seismic demands, even if a seismic separation joint is provided to reduce the anticipated ordinary steel moment frame demand to levels commensurate with the LFRS. Unity values (demand divided capacity) greater than 1.0 indicate inadequate capacity relative to anticipated demand. Presuming full seismic separation and actual seismic demands, the existing ordinary steel moment frame unity reaches a maximum of 1.70. Translated, this equates to portions of the steel moment frames being stressed to approximately 170% of capacity.

Other items remain that, in the opinion of the undersigned, would likely require significant mitigation in order to bring the structure into compliance with actual site-specific seismic demand and current code requirements for essential facilities. A brief list of items that would likely be required in order to salvage the existing structures and bring them into compliance with current structural requirements for essential facilities would include (but not necessarily be limited to):

ALL STRUCTURES

- Soil grouting (per previous soils report recommendations) to improve foundation bearing capacity (alternately, a new building could benefit from more cost-effective methods to improve soil bearing capacity, such as over-excavation & engineered fill)
- Seismic separation at adjoining Admin/North Wing & Admin/South Wing walls, likely via newly constructed stud walls which would reduce the usable space in the affected structures

NORTH WING

- Verification of bar reinforcing size & spacing
- New (steel) moment frame & foundation elements at the front wall line to replace or supplant the existing questionable concrete moment frame
- Removal & replacement of the older and deteriorating wood framed roof
- Additional out-of-plane anchorage of the masonry block walls to the roof diaphragms

ADMINISTRATION

- Verification of existing shearwall sheathing & nailing
- Verification of existing roof & floor diaphragm sheathing & nailing
- Strengthening of existing and/or addition of new shearwalls via additional sheathing/ nailing/hold-downs/straps and new foundation elements for new foundation hold-downs
- Strengthening of roof & floor diaphragms to enable transfer of seismic loads to shearwalls
- Additional out-of-plane anchorage of the walls to the roof & floor diaphragms

SOUTH WING

- Verification of all steel connections, including steel anchorage to the foundation
- Strengthening of existing steel framing or addition/replacement of steel moment frames

In summary, it is the opinion of the undersigned, based on our evaluation of the existing lateral force resisting systems, that mitigation of the existing structures to comply with current anticipated site-specific seismic demand for current code requirements for essential facilities, while feasible, is not recommended, and that full replacement with a new structure would be preferred in order to provide the City of Fort Bragg with a reliable structure that both complies with current site and essential facilities requirements as well as minimizes undesirable maintenance issues for the foreseeable future.

If any questions or concerns arise regarding this issue, please feel free to contact our office at your convenience as may be required. Thank you for the opportunity to serve your structural engineering needs.

T. Merritt Mavy, P.E.
C69451, Exp. 06/30/24
Attachments: Tables 1 & 2

TABLE 1
CHANGES IN SEISMIC SITE CRITERIA

Seismic Data	Welty 2010	Covenant 2023	% Change
Site Class	D	D	n/a
SDC	D	D	n/a
I_E	1.50	1.50	0.0%
S_S	1.500	1.504	0.4%
S_1	0.675	0.607	-6.8%
S_{DS}	1.000	1.204	20.4%
S_{D1}	0.675	0.405	-27.0%

TABLE 2 - COMPARISON OF SEISMIC CRITERIA

BLDG	Seismic Data	Welty 2010 w/Inadequate Seismic Joints	Covenant 2023 (E) w/o Seismic Joints	Covenant 2023 (E) w/North Seismic Joints	Covenant 2023 (E) w/N&S Seismic Joints
NORTH WING	LFRS	Stl SCBF/SMF	Ord Reinf Masonry SW	Ord Reinf Masonry SW	Ord Reinf Masonry SW
	R	6.0	2.0	2.0	2.0
	Cs	0.250	0.902	0.902	0.902
	V_E (k)	62.95	278.44	278.44	278.44
ADMIN/ OFFICES	LFRS	Lt Frm Wd Shearwalls	Ord Reinf Masonry SW	Stl OMF	Lt Frm Wd Shearwalls
	R	6.5	2.0	3.5	6.5
	Cs	0.231	0.902	0.516	0.278
	V_E (k)	23.82	179.63	102.65	55.70
SOUTH WING (N-S)	LFRS	Stl OMF	Ord Reinf Masonry SW	Stl OMF	Stl OMF
	R	3.5	2.0	3.5	3.5
	Cs	0.429	0.902	0.516	0.516
	V_E (k)	36.70	216.50	123.71	123.71
SOUTH WING (E-W)	LFRS	Lt Frm Wd Shearwalls	Ord Reinf Masonry SW	Lt Frm Wd Shearwalls	Lt Frm Wd Shearwalls
	R	6.5	2.0	6.5	6.5
	Cs	0.231	0.902	0.278	0.278
	V_E (k)	19.80	216.50	66.62	66.62

Definitions For Table Data

SDC: Seismic Design Category based on occupancy
I_E: Seismic Importance Factor
S_S: Mapped Short Period Spectral Acceleration
S_1: Mapped 1 Second Spectral Acceleration
S_{DS}: Design Short Period Spectral Acceleration
S_{D1}: Design 1 Second Spectral Acceleration
LFRS: Lateral Force Resisting System
R_{EQ}: Seismic Response Modification Coefficient
C_S: Seismic Response Coefficient
V_E (k): Base Shear (1 k = 1 kip or 1000 lbs)

Architectural:

G/A proposes that the current Main Street Fire Station be completely replaced due to its high FCI Index number and inability to be renovated to meet Essential Facility Requirements, ASCE Standard 31-03.

As stated in the 2007 Public Facility Master Plan the Facility Condition Index can help determine the assumption regarding the best Return on Investment and the overall condition of the building to meet certain demands as an Essential Facility or ability to meet 'Immediate Occupancy' following a seismic event, once renovated.

The Grossman Group states one of the Highest Priorities in the Policy Recommendation is;

> *2. Life and safety deficiencies in the existing Main Fire Station structure may result in partial collapse of portions of the main fire station and/or result in substantial damage to equipment as a result of a seismic event. Providing emergency services after a seismic event is critical to protecting the life and safety of the residents of the City of Fort Bragg and if fire equipment is not available it will not be possible to provide the required firefighting services.*

To measure the viability G/A looked at the FCI;

1. Calculate FCI, Facility Condition Index, which is determined by taking the estimated cost to renovate the building divided by the cost of new construction. The higher the FCI number the poorer the overall condition of the building.
2. In 2007, the Grossman Group's calculation was 46%
3. G/A incorporated this information into our analysis and created two new cost estimates, renovation and new construction. 2023 FCI was 97%.

According to the FCI Index, this number determines that the building should not be repaired for two reasons:

1. As defined by the Grossman Group's Summary of Facility Conditions, a FCI higher than 50 indicates that the building can't economically be renovated.
2. FCI higher than 50 also indicated that the building has continued to degrade, potentially beyond any amount of renovation. Since the time of the Grossman's Report, 14 years have elapsed, that also has significantly increased cost of construction for even feasibly cost effective renovations.

PARAMETERS OF RENOVATION COST ESTIMATE

The main driving factor in the Renovation Cost Estimate is its basic ability to meet ASCE 31-03 standard requirements for an Essential Facility to serve the community following a seismic event. The estimate was derived by two means;

1. Regarding the structural/seismic renovations
2. Additional critical Rehabilitation items
3. Code Requirements and accessibility

The renovation used the cost estimate essential upgrades are associated with the information provided in I.L Welty & Associates, Main Street Fire Station Seismic Evaluation. This report defines a list of main upgrades to include a lump sum for structural Improvements, Soil Grouting, Replacing Roofs, Abatement, Fire Sprinklers and Restoration of any finishes disrupted during these upgrades.

Project Budgetary Cost Estimate

Item	North Wing	Offices and Crew's Rooms	South Wing	Line Total
Structural Improvements	$403,200 (1)	$80,000	$52,000	$535,200
Soil Grouting				475,000
Restore Finishes(2)	108,000	98,000	57,000	263,000
Remove and Replace Roof(3)	25,300			25,300
Hazardous Material Abatement(4)				57,000
Fire Sprinkler System	15,000			15,000
Subtotal				1,370,500
15% Contingency				205,600
Relocation Allowance(5)				10,000
Professional Fees(6)				95,900
Construction Management(7)				54,800
Project Total				$1,736,800

* Provided from I.L Welty & Associates report 2009 Main Street Fire Station Seismic Evaluation

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CRITICAL REHABILITATION ITEMS/SCOPE OF WORK

E Cost Estimate:

G/A evaluated the Project Budgetary Cost Estimate numbers in current day pricing, along with investigation of additional, essential renovations, in order of importance.

1. Inoperable fire truck door entrances. Both the North and South Wing fire bays are substandard widths for entrances. A minimum of 18' should be allocated for each bay.
2. Waterproofing. The sizable cost to create seismic gaps and close those areas to create waterproofing between the three building. Explained later by Structural Engineer.
3. Soil Grouting. Requires replacing a portion, if not all of the slab in certain areas. If too much of the slab is replaced, it could not be structurally viable without full replacement.
4. Structural Connections. Primarily in the Roof, Second Floor and Walls throughout
5. Roof Replacement. Structure under all roofing systems will need to be replaced due to extensive leaking and wood construction.
6. Shear Walls. After they are exposed in many areas and finishes will need to be replaced too.
7. Foundations and Hold Downs. Required on both North and South Wing
8. Missing rooms and inadequate building layout such as the Apparatus rooms, Upgraded Restrooms, hose rack and air rack rooms.
9. Mold Remediation Study. Most Fire Stations are known to have mold due to the inadequate ventilation. The International Association of Fire Fighters recommend that all stations have humidity control and sufficient ventilation. It is worthwhile to have a study done that would address this issue since there does not appear to be sufficient ventilation in the station. The HVAC systems are in need of upgrading to current energy efficiency standards.
10. Exhaust Emission Control is not installed. As documented on site and due to the age of the Fire Station, there are no systems to control the amount of diesel exhaust which is generated. There are two types of documentation which outline diesel as a 'human carcinogen', Bulletin 50 issued by the National Institute of Occupational Safety and Health (NIOSH) and OSHA. Both state prolonged exposure to exhaust and diesel particulates increases the risk of cardiovascular disease, cardiopulmonary disease, respiratory disease and cancer.

    This is particularly important issue for the long term safety of the Fire Station's firefighters and labor force since these gases can become trapped in the crew quarters, offices and apparatus bays for extended period of times.
    There are three general types of filters

    - Engine Exhaust Filters-only exhaust particulate is removed while gases aren't filtered. Cost for a system installed in 2017 was $70,650.

- Local Tailpipe Exhaust Ventilation. This type of system requires the user to always attach but can be installed by the user for a reduced installation cost. Cost is estimated at $60,000 per system.
- Dilution Ventilation-Fan exhaust system that moves the contaminated air outside and fresh makeup air into the garage through open doors. This could be most cost ineffective because of the cost to heat and cool the makeup air.

Current Code And Accessibility Inadequacies:

The Fire Station must meet all 2022 California Building Codes, along with Title 24 accessibility requirements.

a. This is the general rule with accessibility upgrades;

If the construction value of the remodel exceeds $161,298, California code requires an upgrade to full accessibility compliance for the building entry, path of travel to the area of remodel and restrooms serving the remodel. If the value of construction is less than $161,298, then 20% of the value of construction must be spent on accessibility upgrades, addressed in the following order:

- accessible entrance
- accessible route to area of remodel
- at least one accessible restroom for each sex
- accessible drinking fountains, and when possible
- accessible parking, storage and alarms
- Elevator to the Second Floor

Based on the estimated cost estimate the renovation will exceed the $161,298 so this will require that we make all upgrades.

b. Separate locker rooms, sleeping quarters and bathrooms for men and women. In 2019, it was estimated that 10% of the labor force, including career and volunteer representatives, are female. This number grows every year.

This information informed the E Cost Estimate to follow.

Fort Bragg Main Street Fire Station

(E)Renovation Construction Cost Estimate

Gutierrez/ Associates Architects
April 5, 2023

Methodology	G/A reviewed 2007 Master Plan, 2009 Geotechnical Report, 2009 Seismic Report and Existing Conditions of the building during a site visit. G/A and Covenant Engineers evaluated all of this information to aid Public Works if renovation or new construction is optimal. This estimate renovates and demos the existing building.
Building Footprint	13,062 SF
Site	22,500 SF

#	Name	Description	SF/LF/Q	Cost/Sq Ft	Total
Demolition					
1	Building Demolition	North Wing- front façade, roof, interior walls, ceiling, slab, perimeter exterior coring, lighting, electrical. Administrative Wing- roof, walls, shear walls, finishes, lighting, electrical, kitchen, offices, siding, windows. South Wing- rollupdoors, fiberglass window	9,416	$8.00	$75,328.00
2	Asphalt	All site asphalt will be removed	8,992	$8.00	$71,936.00
3	Asbestos Abatement	Generally throughout the building. Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, $57,000.Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	12,880	$5.00	$64,400.00
Site Operations					
1	Vistor, Public and Staff Parking	Provide new parking lot to accommodate all users of the Fire Station. Must meet all current codes, including accessible parking, wheel stops and planting. Accessible parking based on number of parking stalls, ie 26-50 would require 2, and of that one would be Van, EV and Photovolatics. Bike Parking	2,248	$21.00	$47,208.00
2	Site Signage	Provide new sign at entrance of facility and preservation of bell and dedication plaque w brass firefighter. Integrated concrete podiums	3	$4,000.00	$12,000.00
3	Lighting at Exterior	Provide exterior lighting for building and Parking Lot. LED flood lights mounted on the building, pole mounted and site lights to front entrance	20	$850.00	$17,000.00
4	Entrance Walkways	It will be an entry feature path into the building, and will relate to the new entrance into the facility. Any other sidewalks into the Building	1962	$17.00	$33,354.00
5	Landscaping	Required at parking lot and entrance. Parking lot and entrance require greenscape	850	$17.00	$14,450.00
6	Bioretention	10' planter in parking lot bioretention to treat parkinglot runoff	1150	$30.00	$34,500.00
7	Firefighter Patio	Currently there is outdoor space, which would be more integrated into the building and connected to the Day Room and Kitchen	380	$100.00	$38,000.00
8	Canopy	A new canopy will be constructed at the entrance to replace the deteriorating canopy it will relate to the new entrance and new windows	120	$200.00	$24,000.00
9	Trash and Recycling	Enclosure of CMU with front and side doors. Secure but accessible for garbage trucks	220	$100.00	$22,000.00
10	N Generator	Propane Powered and Large enough for whole facility	1	$75,000.00	$75,000.00
11	Covered Parking	Parking Canopies on one side of the parking lot	2080	$40.00	$83,200.00
12	Security Fencing	Encompassing Parking Lot	500	$40.00	$20,000.00
Station Office and Firefighter Living Area					
1	Captain's Office	Larger Office for Head of Staff	120	$230.00	$27,600.00
2	Lobby Desk/Lounge	Open area with desk and storage at front entrance	108	$230.00	$24,840.00
3	Training Room	Large enough to accommodate staff	180	$300.00	$54,000.00
4	Library	Training books and History of the Fire Station. Could combine with the current rec room	300	$300.00	$90,000.00
5	Crew Office	Large Room with space for cubicles or desks for staff to work	121	$230.00	$27,830.00
6	Public/Staff Restrooms	Upgrade to all code requirements based on occupancy	80	$300.00	$48,000.00
7	Mop Sink Closet	Storage for cleaning supplies for restrooms. One at all locations near restrooms	36	$200.00	$14,400.00
8	I.T. Server	New I.T. server room, will be a main hub for all terminating data lines, and the lines coming in from the computer room which will go to the FAA secured server	36	$200.00	$7,200.00
9	Mechanical Room	Sized for HVAC, electrical, water heater, etc	200	$75.00	$15,000.00
10	Storage	For files	64	$200.00	$12,800.00
11	Siding	Batten Board	1440	$18.00	$25,920.00
12	Day Room	Relaxation area for crew in off hours	300	$230.00	$69,000.00
18	Kitchen	Open concept with cabinetry, stove, dishwasher, sink, counters around and island	330	$300.00	$99,000.00
19	Laundry	Industrial Machines and prep area	80	$200.00	$16,000.00
20	Crew Quarters	Large open room for dorm style sleeping	300	$75.00	$22,500.00
21	Single Room Crew Quarters	Private enclosed room (2)	324	$230.00	$74,520.00
22	Gym	Need information on equipment, room size based on existing	368	$180.00	$66,240.00
23	Mens Restroom w/ Lockers and Showers	Based on code Men's and Women's will be required	320	$280.00	$89,600.00
24	Womens Restroom w/Locker and Showers	Based on code Men's and Women's will be required	320	$280.00	$89,600.00
25	Storage	Storage room	49	$200.00	$9,800.00
26	Roof/Flashing	Roof for middle building	3480	$12.00	$41,760.00

27	Windows	Windows to Roof	7	$3,500.00	$24,500.00
28	Doors	Sliding Doors to Deck	1	$7,500.00	$7,500.00
29	HVAC	General for all Buildings-minimal in Apparatus Bays	3480	$20.00	$69,600.00
23	Plumbing	General	13,062	$14.00	$182,868.00
24	Fire Sprinklers	North Wing	4791	$9.00	$43,119.00
25	Electrical	General	13,062	$33.00	$431,046.00
30	Elevator	Code required for public buildings	1	$145,000.00	$145,000.00
North Apparatus Bay					
1	Workshop/Shop	One bay of the Apparatus will not drive through and will house antique truck/gear storage	360	$180.00	$64,800.00
2	Hose Rack Room	Area to wash and change shoes, etc before moving into Firefighter Living Area	144	$180.00	$25,920.00
3	Air Fill Room	Room for compressor and regulators, racks to store cylinders, exterior door	150	$180.00	$27,000.00
4	Response/Charging Alcove	Space for charging batteries, cellphone, radios, counter cabinets above and below	24	$200.00	$4,800.00
5	Mudroom/ Clean Room	Direct access to Apparatus Bay and into main fire station. Counter, upper and lower cabinets, wash sink and seating area	150	$200.00	$30,000.00
6	Gear Storage	Racks for gear and boots located adjacent to trucks	90	$250.00	$22,500.00
7	Roof/Flashing	Roof leak extensively and has damaged the building	4791	$12.00	$57,492.00
8	Wood Trusses	Trusses are damaged from leaking	4791	$14.00	$67,074.00
9	Front Façade	Front Façade Beaux Relief 30s Detailing	10800	$20.00	$216,000.00
10	Roll up Doors	Commercial Overhead Door Models 250/270, 251/271 24 Gauge Steel - 2" Thick - Raised or Flush Steel Panel	3	$11,850.00	$35,550.00
11	Glass Block	Fire rated	72	$40.00	$2,880.00
12	Emission Exhaust	Engine Exhaust Filters	1	$70,000.00	$70,000.00
South Apparatus Bay					
1	Roll up Doors	Commercial Overhead Door Models 250/270, 251/271 24 Gauge Steel - 2" Thick - Raised or Flush Steel Panel	6	$11,850.00	$71,100.00
2	Siding	Corrugated Metal Siding	2786	$35.00	$97,510.00
3	Windows	Replace the damaged fiberglass windows	368	$55.00	$20,240.00
4	Emissions Exhaust	Engine Exhaust Filters	1	$70,000.00	$70,000.00
Structural Improvements					
1	South Wing	Information Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, $52,000. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	3465	40% Inflation from 2009-2023	$72,800.00
2	North Wing	Information Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, $403,200. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	4791	40% Inflation from 2009-2024	$564,480.00
3	Soil Grouting	Information Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, $475,000. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	1	40% Inflation from 2009-2025	$665,000.00
4	North Wing FF+E	Information Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, for the North Wing, $108,000. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	4791	$0.00	$0.00
5	South Wing FF+E	Information Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, for the South Wing $57,000. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	3465	$0.00	$0.00
Utilities					
1	HVAC	General for all Buildings-minimal in Apparatus Bays	3480	$20.00	$69,600.00
2	Plumbing	General	13,062	$14.00	$182,868.00
3	Fire Sprinklers	North Wing	4791	$9.00	$43,119.00
4	Electrical	General	13,062	$33.00	$431,046.00
5	Elevator	Code required for public buildings	1	$145,000.00	$145,000.00
				Sub	$5,518,398.00
Overhead					
	Professional (Fees, Arch, Eng.)		14%		$772,575.72
	Builder Risk		0.5%		$27,591.99
	Bond		0.7%		$38,628.79
	Permit		2%		$110,367.96
	Profit		12%		$662,207.76
			Total		$7,129,770

RECOMMENDATION FOR A NEW FIRE STATION

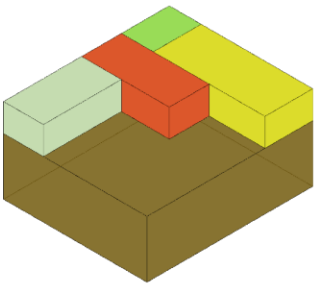
Program:

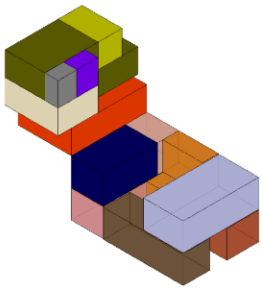
Criteria for determining project requirements is evaluated by the Essential Services Buildings Seismic Safety Act of 1986 and Building Codes, specifically the Title 24 Accessibility act. Design and Programming will also be decided by the functionality of a Fire Station. Areas that effect the programming would include, number of firefighters, number of trucks and uses that effect the specific station. Three main areas are required for Fire Stations and include:

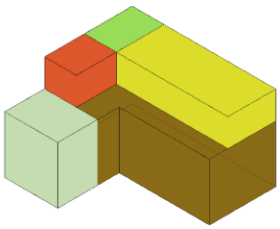
1. Apparatus Bays and Maintenance, vehicle storage, maintenance, repair and supply support
2. Administration and Training. There must be adequate spaces to educate the staff, such as Training, Day Room, Offices, etc.
3. Living Areas. This area is needed for manning of the Fire Station 24 hours and includes, separate sleeping quarters for men and women, gym etc.

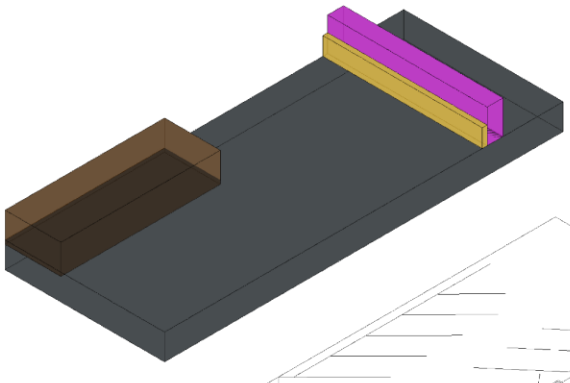
Current conditions and functionality of the space must be evaluated before final Program is developed.

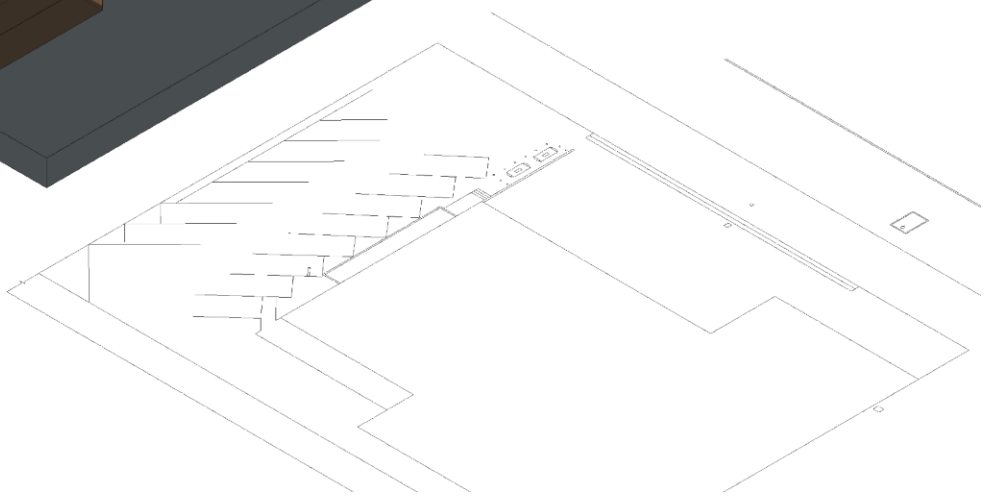
- AIR FILL ROOM
- HOSE RACK ROOM
- WORKSHOP
- GEAR STORAGE
- APPARTUS BAY
- CAPTAIN'S OFFICE
- LOBBY DESK/LOUNGE
- IT SERVER
- TRAINING ROOM
- CREW OFFICE
- TRAINING ROOM
- SINGLE ROOM CREW QUARTER
- CREW QUARTERS
- GEAR STORAGE
- WOMENS/MENS LOCKER RESTROOMS
- CREW OFFICE
- LIBRARY
- RESTROOMS
- ENTRY PATHWAY
- FENCING
- PARKING
- LANDSCAPING











GUTIERREZ/ASSOCIATES ARCHITECTS
5701 INTERNATIONAL BLVD, NO 7
OAKLAND, CA 94621
O: 510.839.3311

Fort Bragg Main Street Fire Station

Programming

Architectural Space Programming
Gutierrez/ Associates Architects
April 5, 2023

Methodology

G/A reviewed 2007 Master Plan, 2009 Geotechnical Report, 2009 Seismic Report and Existing Conditions of the building during a site visit. G/A and Covenant Engineers evaluated all of this information to aid Public Works if renovation or new construction is optimal. This estimate programs the existing and new buildings

	Name	Description	Rm Amt	Dims	SF
	Site Operations				
1	Vistor, Public and Staff Parking	Provide new parking lot to accommodate all users of the Fire Station. Must meet all current codes, including accessible parking, wheel stops and planting. Accessible parking based on number of parking stalls, ie 26-50 would require 2, and of that one would be Van, EV and Photovolatics. Bike Parking	1	60' x 150'	8,992
2	Site Signage	Provide new sign at entrance of facility and preservation or relocation of dedication plaque.	1	N/A	N/A
3	Lighting at Exterior	Provide exterior lighting for building and Parking Lot. LED flood lights mounted on the building, pole mounted and site lights to front entrance	1	N/A	N/A
4	Entrance Walkways	The sidewalk will relate to the new entrance into the facility. Any other sidewalks into the Building	1	6' x 60'	360
5	Landscaping	Required at parking lot and entrance. Parking lot and entrance require greenscape and potential bioretention systems	1	21' x 50'	1050
6	Canopy	A new canopy will be constructed at the entrance to relate to the new entrance and new windows	1	N/A	N/A
7	Generator	Necessary to be an essential facility for the whole building	1	N/A	N/A
8	Trash and Recycling	Enclosure of CMU with front and side doors. Secure but accessible for garbage trucks	1		
9	Fire Hydrants	As required by the County standards	1	N/A	N/A
10	Security Fencing	Encompassing the parking lot and Site	1	100	100
11	Generator	Gas Powered and Large enough for whole facility	1	N/A	N/A
12	Covered Parking	Partial Covered Parking lot, adaquet for solar	1		2080
	Station Office and Reception Area				
1	Captain's Office	Larger Office for Head of Staff	1	10' x 12'	120
2	Private Office	For other Supervisor Staff	2	10' x 12'	240
2	Lobby Desk/Lounge	Open area with desk and storage at front entrance	1	9' x 12'	108
3	Training Room	Large enough to accommodate staff	1	15' x 20'	180
4	Library	Training books and History of the Fire Station. Could combine with the current rec room	1	20' x 30'	600
5	Crew Office	Large Room with space for cubicles or desks for staff to work	1	12' x 12'	144
6	Public/Staff Restrooms	Upgrade to all code requirements based on occupancy	4	7' x 10'	280
7	Mop Sink Closet	Storage for cleaning supplies for restrooms. One at all locations near restrooms	2	5' x 8'	40
8	I.T. Server	New I.T. server room, will be a main hub for all terminating data lines, and the lines coming in from the computer room which will go to the FAA secured server	1	9' x 15'	108
9	Mechanical Room	Sized for HVAC, electrical, water heater, etc	1	10' x 20'	200
10	Storage	For files	1	15' x 15'	225
	Firefighter Living Area				
1	Day Room	Relaxation area for crew in off hours	1	15' x 20'	300

2	Kitchen	Open concept with cabinetry, stove, dishwasher, sink, counters around and island	1	15' x 22'	330
3	Dining Area	Either separate or connected to Kitchen	1	15' x 15'	225
3	Laundry	Industrial Machines and prep area	1	9' x 20'	180
4	Crew Quarters			15' x 20'	300
		Large open room for dorm style sleeping	1		
	Single Room Crew Quarters		2	10' x 10'	200
		Private enclosed room			
5	Gym	Need information on equipment, room size based on existing	1	20' x 30'	600
6	Mens Restroom w/ Lockers and Showers	Based on code Men's and Women's will be required	1	16' x 23'	368
7	Womens Restroom w/Locker and Showers	Based on code Men's and Women's will be required	1	16' x 23'	368
8	Storage	Storage room	1	10' x 10'	100
9	Elevator	Elevator and cotrols closet	1	12' x 10'	120
Apparatus Bay					
1	Apparatus Bays	4 Apparatus Bay-Each Bay must be a minimum of 18'. 2 Bays will be drive through and the other will house a workshop/storage antique trucks	1	72' x 80'	5760
2	Workshop/Shop	One bay of the Apparatus will not drive through and will house antique truck/gear storage	1	20' x 25'	500
3	Hose Rack Room	Area to wash and change shoes, etc before moving into Firefighter Living Area	1	15' x 15'	225
4	Air Fill Room	Room for compressor and regulators, racks to store cylinders, exterior door	1	10' x 15'	150
5	Response/Charging Alcove	Space for charging batteries, cellphone, radios, counter cabinets above and below	1	2' x 12'	24
6	Mudroom/ Clean Room	Direct access to Apparatus Bay and into main fire station. Counter, upper and lower cabinets, wash sink and seating area	1	10'x 15'	150
7	Gear Storage	Racks for gear and boots located adjacent to trucks	1	3' x 30'	90
8	Firefighter Patio	Currently there is outdoor space, which would be more integrated into the building and connected to the Day Room and Kitchen	1	15' x 20'	300
9	Compressor Room		1	9' x 10'	90
10	Storage		1	15' x 25'	375
				SF	13,000

GUTIERREZ/ASSOCIATES ARCHITECTS
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COST

N Construction Cost Estimate:

Due to the similar costs of renovation versus new construction, it is the recommendation of G/A and its consultants that funding for a new Fire Station be acquired. Designing for cost efficiency can be achieved by numerous means.

In a study by the NFPA Research department on Renovation Needs of the US Fire Service, there are suggestions on how to reduce costs.

a. Design the building to be rectilinear. More straight forward construction will allow for efficient design and construction fees

b. Use of pre-fabricated buildings. The NFPA suggests using wood framed pre-fabricated, however G/A would counter and suggest steel Pre-fabricated buildings, skinned in wood, aluminum siding or stucco would attain a better cost and long term building. Typically, wood framed pre-fabricated buildings are used in Housing construction.

c. Use of City owned demolition teams to deconstruct the Existing Building and Site

d. Proposed parameters of a new Fire Station:

- 10,000 to 12,000 sq ft building
- $100-$150 for metal structure
- $75-$100 for Architecture Skin
- $250-$300 for Interior and Finishes
- $425-$500 sq ft total

GUTIERREZ/ASSOCIATES ARCHITECTS
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Fort Bragg Main Street Fire Station

(N) Construction Cost Estimate

Architectural space programming
Gutierrez/ Associates Architects
April 5, 2023

Methodology	G/A reviewed 2007 Master Plan, 2009 Geotechnical Report, 2009 Seismic Report and Existing Conditions of the building during a site visit. G/A and Covenant Engineers evaluated all of this information to aid Public Works if renovation or new construction is optimal. This estimate demos the existing structures and site and re programs the site and building new.
Building Footprint	13,000 SF
Site	22,500 SF

#	Name	Description	SF/LF/Q	SF/LF/Q	SF/LF/Q
Demolition					
1	Building Demolition	Total demolition of site all three wings. Demolition might be in phases to keep Fire Station opperational	12,880	$10.00	$128,800.00
2	Asphalt	All site asphalt will be removed	8,992	$8.00	$71,936.00
3	Asbestos Abatement	Generally throughout the building. Based on Study City of Fort Bragg Main Street Station Seismic Evaluation. 2009 Estimate, $57,000. Inflation Information source UC Berkeley Terner Center, Turner Construction, and DGS California Construction Cost Index CCCI	14,290	$5.00	$71,450.00
Site Preparation					
1	Survey		1	$9,800.00	$9,800.00
2	Geotechnical Soils Report		1	$8,000.00	$8,000.00
3	OverX/ Grading	Preparing the site for a New Building	1	$200,000.00	$200,000.00
Site					
1	Vistor, Public and Staff Parking	Provide new parking lot to accommodate all users of the Fire Station. Must meet all current codes, including accessible parking, wheel stops and planting. Accessible parking based on number of parking stalls, ie 26-50 would require 2, and of that one would be Van, EV and Photovolatics. Bike Parking	8,992	$5.00	$44,960.00
2	Site Signage	Provide new sign at entrance of facility and preservation of bell and dedication plaque w brass firefighter. Integrated concrete podiums	3	$4,000.00	$12,000.00
3	Lighting at Exterior	Provide exterior lighting for building and Parking Lot. LED flood lights mounted on the building, pole mounted and site lights to front entrance	20	$850.00	$17,000.00
4	Entrance Walkways	The sidewalk will relate to the new entrance into the facility. Any other sidewalks into the Building	1,962	$10.00	$19,620.00
5	Landscaping	Required at parking lot and entrance. Parking lot and entrance require greenscape and potential bioretention systems too	850	$17.00	$14,450.00
6	Bio Remediation	10' wide planter in parking lot	1150	$30.00	$34,500.00
7	Firefighter Patio	Currently there is outdoor space, which would be more integrated into the building and connected to the Day Room and Kitchen	380	$100.00	$38,000.00
8	Canopy	A new canopy will be constructed at the entrance to relate to the new entrance and new windows	120	$200.00	$24,000.00
9	Trash and Recycling	Enclosure of CMU with front and side doors. Secure but accessible for garbage trucks	220	$100.00	$22,000.00
10	Security Fencing	Encompassing the parking lot	500	$42.00	$21,000.00
11	Generator	Propane Powered and Large enough for whole facility	1	$75,000.00	$75,000.00
12	Covered Parking	Parking Canopies on one side of the parking lot	2080	$40.00	$83,200.00
Station Office and Firefighter Living Quarters					
1	Captain's Office	Larger Office for Head of Staff	120	$275.00	$33,000.00
2	Lobby Desk/Lounge	Open area with desk and storage at front entrance	108	$300.00	$32,400.00
3	Training Room	Large enough to accommodate staff	180	$275.00	$49,500.00
4	Library	Training books and History of the Fire Station. Could combine with the current rec room	300	$300.00	$90,000.00
5	Crew Office	Large Room with space for cubicles or desks for staff to work	121	$275.00	$33,275.00
6	Public/Staff Restrooms	Design to all code requirements based on occupancy	80	$350.00	$56,000.00
7	Mop Sink Closet	Storage for cleaning supplies for restrooms. One at all locations near restrooms	36	$200.00	$14,400.00
8	I.T. Server	New I.T. server room, will be a main hub for all terminating data lines, and the lines coming in from the computer room which will go to the FAA secured server	36	$200.00	$7,200.00
9	Mechanical Room	Sized for HVAC, electrical, water heater, etc	200	$200.00	$40,000.00
10	Storage	For files	64	$200.00	$12,800.00
11	Day Room	Relaxation area for crew in off hours	300	$290.00	$87,000.00
12	Kitchen	Open concept with cabinetry, stove, dishwasher, sink, counters around and island	330	$300.00	$99,000.00

13	Laundry	Industrial Machines and prep area	80	$280.00	$22,400.00
14	Crew Quarters	Large open room for dorm style sleeping	300	$200.00	$60,000.00
15	Single Room Crew Quarters	Private enclosed room (2)	324	$200.00	$64,800.00
16	Gym	Need information on equipment, room size based on existing	368	$190.00	$69,920.00
17	Mens Restroom w/ Lockers and Showers	Based on code Men's and Women's will be required	320	$315.00	$100,800.00
18	Womens Restroom w/Locker and Showers	Based on code Men's and Women's will be required	320	$315.00	$100,800.00
19	Storage	Storage room	49	$200.00	$9,800.00
Apparatus Bay					
1	Apparatus Bays	4 Apparatus Bay-Each Bay must be a minimum of 18'. 3 Bays will be drive through and the other will house a workshop/storage antique trucks	5,760	$375.00	$2,160,000.00
2	Workshop/Shop	One bay of the Apparatus will not drive through and will house antique truck/gear storage	360	$275.00	$99,000.00
3	Hose Rack Room	Area to wash and change shoes, etc before moving into Firefighter Living Area	144	$250.00	$72,000.00
4	Air Fill Room	Room for compressor and regulators, racks to store cylinders, exterior door	150	$275.00	$82,500.00
5	Response/Charging Alcove	Space for charging batteries, cellphone, radios, counter cabinets above and below	24	$375.00	$18,000.00
6	Mudroom/ Clean Room	Direct access to Apparatus Bay and into main fire station. Counter, upper and lower cabinets, wash sink and seating area	150	$200.00	$60,000.00
7	Gear Storage	Racks for gear and boots located adjacent to trucks	90	$200.00	$36,000.00
8	Roll up Doors	Commercial Overhead Door Models 250/270, 251/271 24 Gauge Steel - 2" Thick - Raised or Flush Steel Panel	4	$11,850.00	$47,400.00
9	Emissions Control	Engine Exhaust Filters	1	$70,000.00	$70,000.00
Utilities					
1	Elevator	Code required for public buildings	1	$145,000.00	$145,000.00
2	Data	Security Control, Data, Access Control, 2 way communication, Security	13,000	$7.00	$91,000.00
3	HVAC	General	8530	$20.00	$170,600.00
4	Plumbing	General	13,000	$14.00	$182,000.00
5	Fire Sprinklers	General	13,000	$7.00	$91,000.00
6	Electrical	General	13,000	$33.00	$429,000.00
				Sub	$5,632,311.00
Overhead					
	Professional (Fees, Arch, Eng.)		10%		$563,231.10
	Builder Risk		0.5%		$28,161.56
	Bond		0.7%		$39,426.18
	Permit		2%		$112,646.22
	Profit		12%		$675,877.32
			Total		**$7,051,653**

FINAL SUMMARY

As indicted in the report, after analyzing both the architectural and structural concerns in regards to the FCI and existing lateral force resisting systems that the Fire Station has most likely degraded beyond any feasible means to meet Essential Facility Requirements.

It is the recommendation of Gutierrez / Associates architects and Covenant Engineers that the City of Fort Bragg secure funding not for renovation but for new construction. This decision will secure for the City of Fort Bragg a dependable facility to serve the community.

|| mail:PO Box 4260, Bedford, WY 83112 || ph:916-838-1973 or 307-883-6515 ||
|| web:covenantengineers.com || email:merritt@covenantengineers.com ||

Covenant Engineering

"WHEN INTEGRITY COUNTS…"

SUPPORTING STRUCTURAL CALCULATIONS

FOR

Ft. Bragg Fire Station (E) Buildings Structural Evaluation

Ft. Bragg, CA

Job #P22081
April 3, 2023

2022 California Building Code

INDEX

SUMMARY

This set of structural calculations is being provided in support of the structural evaluation summary letter recommending replacement of the existing buildings in lieu of attempted mitigation to improve the structural performance to comply with current requirements for Risk IV essential facilities and site-specific demands. Importantly, this set of structural calculations should not be interpreted as a comprehensive full and complete analysis. Rather, this set of calculations is intended merely to provided sufficient evidence in support of the referenced conclusion recommending replacement by demonstration of substantial weaknesses with the seismic resisting systems.

North Wing
Demand

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Loads for: (E) North Wing

Typ Roof Dead Load	psf
Roofing	4.0
Rf Sht'g	1.5
Framing	3.0
Ceiling Finish	2.2
Misc	1.3
	12.0

Roof Live (0.5:12) 20.0

Masonry Wall Dead Load	psf
8" Thick	88.0

Interior Wall Dead Load	psf
2x @ 16"	1.5
Gyp Board x 2	5.0
Mechanical	1.5
Misc	2.0
	10.0

Seismic Mass

Front Roof Seismic Mass

$Slope_{Roof}$ = 1:12
$Dl_{add'l\ (part)}$ = 0.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 2826.0 sf
Perimeter = 216 ft
$h\text{-}trib_{wall}$ = 9.5 ft
W_{EQ} = 214.7 k

Rear Roof Seismic Mass

$Slope_{Roof}$ = 1:12
$Dl_{add'l\ (part)}$ = 5.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 1744.0 sf
Perimeter = 122 ft
$h\text{-}trib_{wall}$ = 6.0 ft
W_{EQ} = 93.9 k

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) North Front Rm (ASCE 7-16 Table 12.2-1/A9)***

LFRS:	All other bldgs	S_S = 1.504	T_{modal} = 0.00 sec	☐ Extreme Torsion Irregularity?	
Occupancy:	IV	S_1 = 0.607	T_L = 12.00 sec	☑ >35%V Complies w/Table 12.3-3?	
Site Class:	D-Default	F_a = 1.200	T_a = 0.16 sec	☑ Regular in plan at all levels?	
I_{EQ} =	1.50	F_v = 1.000	T_{Max} = 0.22 sec	☑ 2 bays ES Ea Direction?	
R-Factor =	2.00	S_{DS} = 1.203	T_S = 0.336	$C_{s,Design}$ (12.8-2) = **0.902**	
Ω_0 =	2.50	S_{D1} = 0.405	T_o = 0.067	$C_{s,Max}$ (12.8-3 & 4) = 1.897	
C_d =	1.75	$S_{DS,Des}$ = 1.203	☑ No Irregularities?	$C_{s,Min}$ (12.8-5) = 0.010	
				$C_{s,Min,.6g}$ (12.8-6) = 0.228	

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	**$F_{x\ (k)}$**	**$F_{x\ (ASD)}$**	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	16.0	214.7	3435	100.0%	**193.72**	**138.37**	2826	68.5	49.0
	Σ=	214.7	3435	100%	**193.72**	**138.37**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	193.72	77.49	154.98	**154.98**	**110.70**	54.8	39.2	0.80

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: (E) North Rear (ASCE 7-16 Table 12.2-1/A9)

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 2.00
Ω_0 = 2.50
C_d = 1.75

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.13 sec
T_{Max} = 0.18 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.902**
$C_{s,Max}$ (12.8-3 & 4) = 2.354
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.228

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	12.0	93.9	1127	100.0%	**84.72**	**60.51**	1744	48.6	34.7
	Σ=	93.9	1127	100%	**84.72**	**60.51**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/Base$
Roof	84.72	33.89	67.77	**67.77**	**48.41**	38.9	27.8	0.80

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

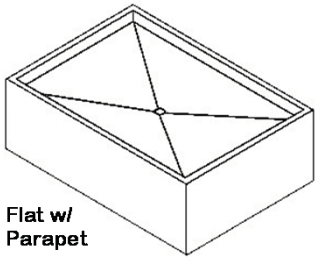
Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

LRFD Wind Design - MWFRS For: (E) North Front Rm (ASCE 7-16 Table 12.2-1/A9)

Structure Criteria

Structure Type: All other structural systems
Roof Type: Flat w/Parapet
Roof Pitch: 0.5:12
Structure Ht AGL: 17.5 ft
Mean Rf Ht AGL: 16.0 ft
Parapet Ht: 17.5 ft
Add'l Floors AGL: 0 Floors
Roof Ht: 16.0 ft
Least Plan Dim: 50.2 ft
Greatest Plan Dim: 57.8 ft
f_0, (Manual): 0.00 Hz
f_0, (Approx): 6.25 Hz
Flexibility Class: Rigid
Building Class: Class 1
Enclosure Class: Enclosed

Roof Type



Site Criteria

Basic Wind Speed: 110 mph
Exposure Category: D
Directionality Factor, K_d: 0.85
Topographic Factor, K_{zt}: 1.00
Gust Effect Factor, G: 1.00
Internal Press. Coeff, GC_{pi}: 0.18

Procedure Checks:

Torsionally Regular: Yes — **Ch. 27 Part 1 Allowed**
Simple Diaphragm: Yes — **Ch. 27 Part 2 Allowed**
Aprox. Symetrical: Yes — **Ch. 28 Part 1 Allowed**
Flat, Gable Or Hip Roof: Yes — **Ch. 28 Part 2 Allowed**

Definitions (Reference ASCE 7-10, 26.2)

Flexible: Slender buildings that have a fundamental natural frequency less than 1 Hz.

Low Rise: Enclosed or partially enclosed buildings that comply with the following conditions:
1. Mean roof height *h* less than or equal to 60 ft.
2. Mean roof height *h* does not exceed least horizontal dimension.

Simple Diaphragm: A building in which both windward and leeward wind loads are transmitted by roof and vertically spanning wall assemblies, through continuous floo rand roof diaphragms, to the MWFRS.

Torsionally Regular: A bullding with the MWFRS about each principal axis proportioned so that the maximum displacement at each story under Case 2, the torsional wind load case, does not exceed the maximum displacement at the same location under Case 1, the basic wind load case.

Open: A building having each wall at least 80 percent open.

Enclosed: A building that does not comply with the requirements for open or partially enclosed buildings.

Partially Enclosed: A building that complies with both of the following conditions:
1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

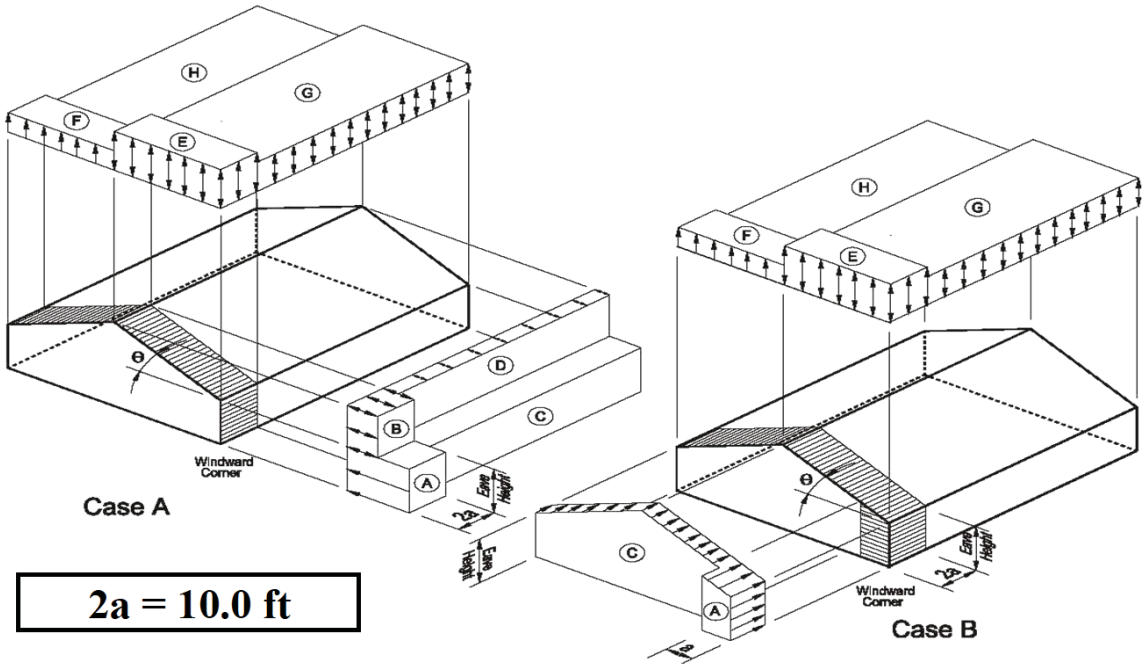
ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) North Front Rm (ASCE 7-16 Table 12.2-1/A9)

Wind Zone Pressure Factors	
Basic Wind Speed: 110 mph	Max Structure Ht: 17.5 ft
Exposure Category: D	Roof Slope: 0.0°
Topographic Factor, K_{zt}: 1.00	Adjustment Factor, λ : 1.51

Ht	λ
15.0 ft	1.47
17.5 ft	1.51
20.0 ft	1.55

Load Case: 1

Maximum Envelope Pressures		Horizontal Pressures				Vertical Roof Pressures				Eave Overhangs	
		End Zones		Interior Zones		End Zones		Interior Zones		End	Interior
		Wall	Pitched Rf	Wall	Pitched Rf	Windward	Leeward	Windward	Leeward	Zone	Zone
Wind Zones:		A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
(Below)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_{S30} (psf)	0.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
(Abv)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_S (psf) =		**29.0**	**-15.1**	**19.2**	**-8.9**	**-34.9**	**-19.8**	**-24.2**	**-15.3**	**-48.8**	**-38.2**



2a = 10.0 ft

Notes:
1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m). Adjust to other exposures and heights with adjustment factor λ.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 28.4-1)
3. For Case B use $\theta = 0°$.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° and 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_S = 0$ in zones B & D.
8. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
9. Notation:
   a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
   h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
   θ: Angle of plane of roof from horizontal, in degrees.

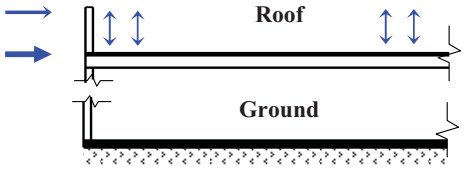
Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) North Front Rm (ASCE 7-16 Table 12.2-1/A9)

This sheet provides a summary of all wind forces at the lvels indicated, based on Part 2 of the envelope procedure as indicated in the previous pages. Gable or parapet loads, where applicable, are included in the main roof level loads.

	LRFD	ASD	Uplift End Zone	Uplift Typ Int
Parapet Typ Int	**29 plf**	**17 plf**	**34.9 psf**	**24.2 psf**
Parapet EZ Add'l	**148 lbs**	**89 lbs**	**20.9 psf (ASD)**	**14.5 psf (ASD)**
Roof Typ Int	**182 plf**	**109 plf**		
Roof EZ Add'l	**936 lbs**	**561 lbs**		



Covenant Engineering

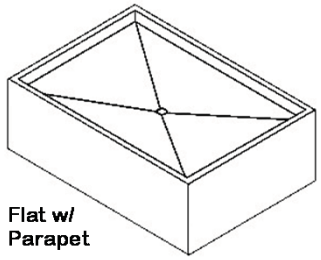
Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

LRFD Wind Design - MWFRS For: (E) North Rear (ASCE 7-16 Table 12.2-1/A9)

Structure Criteria

Structure Type: All other structural systems
Roof Type: Flat w/Parapet
Roof Pitch: 0.5:12
Structure Ht AGL: 12.5 ft
Mean Rf Ht AGL: 12.0 ft
Parapet Ht: 12.5 ft
Add'l Floors AGL: 0 Floors
Roof Ht: 12.0 ft
Least Plan Dim: 35.8 ft
Greatest Plan Dim: 50.2 ft
f_0, (Manual): 0.00 Hz
f_0, (Approx): 7.76 Hz
Flexibility Class: Rigid
Building Class: Class 1
Enclosure Class: Enclosed

Roof Type



Site Criteria

Basic Wind Speed: 110 mph
Exposure Category: D
Directionality Factor, K_d: 0.85
Topographic Factor, K_{zt}: 1.00
Gust Effect Factor, G: 1.00
Internal Press. Coeff, GC_{pi}: 0.18

Procedure Checks:

Torsionally Regular: Yes — **Ch. 27 Part 1 Allowed**
Simple Diaphragm: Yes — **Ch. 27 Part 2 Allowed**
Aprox. Symetrical: Yes — **Ch. 28 Part 1 Allowed**
Flat, Gable Or Hip Roof: Yes — **Ch. 28 Part 2 Allowed**

Definitions (Reference ASCE 7-10, 26.2)

Flexible: Slender buildings that have a fundamental natural frequency less than 1 Hz.

Low Rise: Enclosed or partially enclosed buildings that comply with the following conditions:
1. Mean roof height *h* less than or equal to 60 ft.
2. Mean roof height *h* does not exceed least horizontal dimension.

Simple Diaphragm: A building in which both windward and leeward wind loads are transmitted by roof and vertically spanning wall assemblies, through continuous floo rand roof diaphragms, to the MWFRS.

Torsionally Regular: A bullding with the MWFRS about each principal axis proportioned so that the maximum displacement at each story under Case 2, the torsional wind load case, does not exceed the maximum displacement at the same location under Case 1, the basic wind load case.

Open: A building having each wall at least 80 percent open.

Enclosed: A building that does not comply with the requirements for open or partially enclosed buildings.

Partially Enclosed: A building that complies with both of the following conditions:
1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

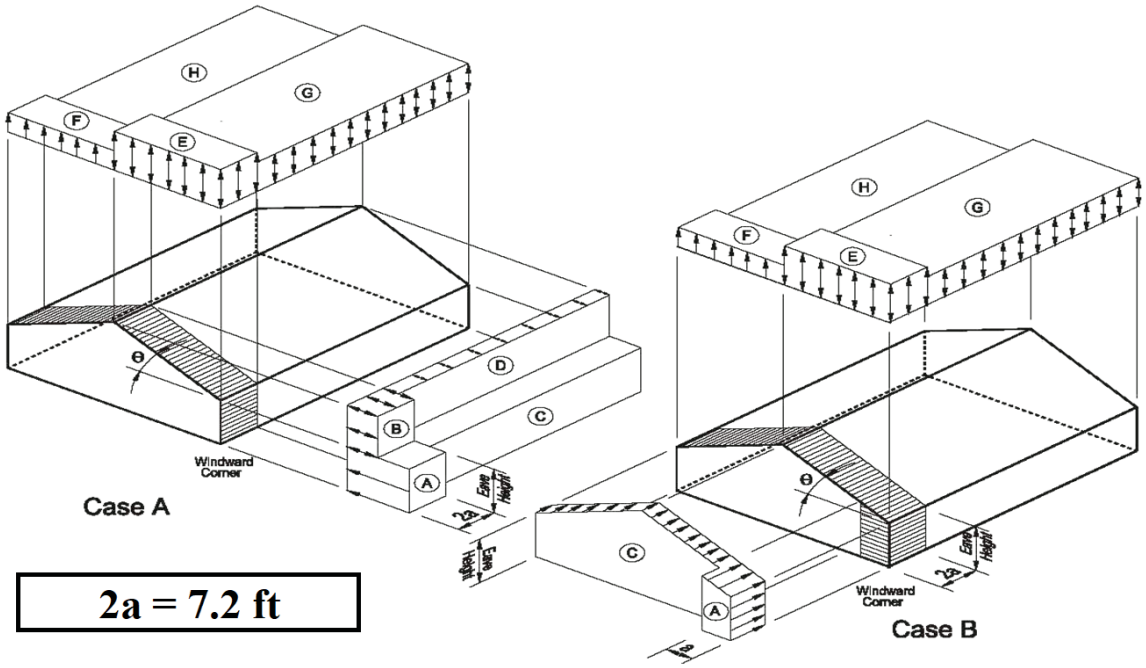
ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) North Rear (ASCE 7-16 Table 12.2-1/A9)

Wind Zone Pressure Factors	
Basic Wind Speed: 110 mph	Max Structure Ht: 12.5 ft
Exposure Category: D	Roof Slope: 0.0°
Topographic Factor, K_{zt}: 1.00	Adjustment Factor, λ : 1.47

Ht	λ
15.0 ft	1.47
12.5 ft	1.47
15.0 ft	1.47

Load Case: 1

Maximum Envelope Pressures		Horizontal Pressures				Vertical Roof Pressures				Eave Overhangs	
		End Zones		Interior Zones		End Zones		Interior Zones		End	Interior
		Wall	Pitched Rf	Wall	Pitched Rf	Windward	Leeward	Windward	Leeward	Zone	Zone
Wind Zones:		A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
(Below)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_{S30} (psf)	0.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
(Abv)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_S (psf) =		**28.2**	**-14.7**	**18.7**	**-8.7**	**-34.0**	**-19.3**	**-23.5**	**-14.8**	**-47.5**	**-37.2**



2a = 7.2 ft

Notes:
1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m). Adjust to other exposures and heights with adjustment factor λ.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 28.4-1)
3. For Case B use $\theta = 0°$.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° and 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_S = 0$ in zones B & D.
8. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
9. Notation:
   a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
   h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
   θ: Angle of plane of roof from horizontal, in degrees.

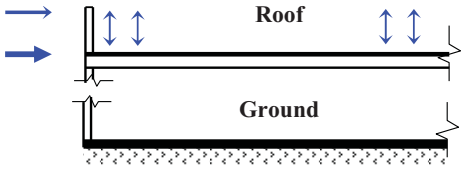
Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) North Rear (ASCE 7-16 Table 12.2-1/A9)

This sheet provides a summary of all wind forces at the lvels indicated, based on Part 2 of the envelope procedure as indicated in the previous pages. Gable or parapet loads, where applicable, are included in the main roof level loads.

	LRFD	ASD	Uplift End Zone	Uplift Typ Int
Parapet Typ Int	**9 plf**	**6 plf**	**34.0 psf**	**23.5 psf**
Parapet EZ Add'l	**34 lbs**	**21 lbs**	**20.4 psf (ASD)**	**14.1 psf (ASD)**
Roof Typ Int	**121 plf**	**73 plf**		
Roof EZ Add'l	**445 lbs**	**267 lbs**		



Administration Bldg
Demand

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Loads for: (E) Admin Front

Typ Roof Dead Load	psf
Roofing	4.0
Rf Sht'g	1.5
Framing	3.0
Ceiling Finish	2.2
Misc	1.3
	12.0

Roof Live (0.5:12) 20.0

Ext Wall Dead Load	psf
Siding	3.0
Wall Sht'g	1.5
2x6 @ 16"	1.6
Gyp Board	2.2
Misc	1.7
	10.0

Interior Wall Dead Load	psf
2x @ 16"	1.5
Gyp Board x 2	5.0
Mechanical	1.5
Misc	2.0
	10.0

Seismic Mass

Roof Seismic Mass

$Slope_{Roof}$ = 1:12
$Dl_{add'l\ (part)}$ = 5.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 2334.0 sf
Perimeter = 58 ft
$h\text{-}trib_{wall}$ = 6.0 ft
W_{EQ} = 70.1 k

Entry Roof Seismic Mass

$Slope_{Roof}$ = 1:12
$Dl_{add'l\ (part)}$ = 0.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 337.0 sf
Perimeter = 0 ft
$h\text{-}trib_{wall}$ = 0.0 ft
W_{EQ} = 4.0 k

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Loads for: (E) Admin Rear

Typ Roof Dead Load	psf
Roofing	4.0
Rf Sht'g	1.5
Framing	3.0
Ceiling Finish	2.2
Misc	1.3
	12.0

Roof Live (4.0:12) 20.0

Floor Dead Load	psf
Flr Finish	4.0
Shtg	2.3
Floor Framing @ 16"	1.5
Dropped Clng Framing	2.0
Misc	2.2
	12.0

Floor Live Load 40.0

Ext Wall Dead Load	psf
Siding	3.0
Wall Sht'g	1.5
2x6 @ 16"	1.6
Gyp Board	2.2
Misc	1.7
	10.0

Exterior Deck Dead Load	psf
Decking	4.0
Framing	2.0
Misc	2.0
	8.0

Interior Wall Dead Load	psf
2x @ 16"	1.5
Gyp Board x 2	5.0
Mechanical	1.5
Misc	2.0
	10.0

Seismic Mass

Roof Seismic Mass

$Slope_{Roof}$ = 4:12
$Dl_{add'l\ (part)}$ = 5.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 1270.0 sf
Perimeter = 137 ft
$h\text{-}trib_{wall}$ = 5.0 ft
W_{EQ} = 86.1 k

2nd Floor Mass

$Dl_{add'l\ (part)}$ = 10.0 psf
$Storage_{(25\%)}$ = 0.0 psf
Area = 1130.0 sf
Perimeter = 137 ft
$h\text{-}trib_{wall}$ = 9.0 ft
W_{EQ} = 37.1 k

Deck Mass

$Dl_{add'l\ (part)}$ = 0.0 psf
Area = 207.0 sf
Perimeter = 0 ft
$h\text{-}trib_{wall}$ = 0.0 ft
W_{EQ} = 1.7 k

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: (E) Admin Front (ASCE 7-16 Table 12.2-1/A9)

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 2.00
Ω_0 = 2.50
C_d = 1.75

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.13 sec
T_{Max} = 0.18 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.902**
$C_{s,Max}$ (12.8-3 & 4) = 2.354
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.228

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	12.0	74.2	890	100.0%	**66.95**	**47.82**	2671	25.1	17.9
	Σ=	74.2	890	100%	**66.95**	**47.82**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	66.95	26.78	53.56	**53.56**	**38.26**	20.1	14.3	0.80

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) Admin Rear (ASCE 7-16 Table 12.2-1/A9)***

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 2.00
Ω_0 = 2.50
C_d = 1.75

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.17 sec
T_{Max} = 0.23 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.902**
$C_{s,Max}$ (12.8-3 & 4) = 1.813
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.228

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	17.0	38.8	660	43.4%	**48.89**	**34.92**	1130	43.3	30.9
2nd Flr	10.0	86.1	861	56.6%	**63.79**	**45.56**	1130	56.5	40.3
	Σ=	124.9	1520	100%	**112.68**	**80.49**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph./_{Base}$
Roof	48.89	14.01	28.01	**28.01**	**20.01**	24.8	17.7	0.57
2nd Flr	77.67	31.07	62.13	**62.13**	**44.38**	55.0	39.3	0.97

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/24/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: (E) Admin Front (ASCE 7-16 Table 12.2-1/C4)

LFRS:	All other bldgs	S_S = 1.504	T_{modal} = 0.00 sec	☐ Extreme Torsion Irregularity?	
Occupancy:	IV	S_1 = 0.607	T_L = 12.00 sec	☑ >35%V Complies w/Table 12.3-3?	
Site Class:	D-Default	F_a = 1.200	T_a = 0.13 sec	☑ Regular in plan at all levels?	
I_{EQ} =	1.50	F_v = 1.000	T_{Max} = 0.18 sec	☑ 2 bays ES Ea Direction?	
R-Factor =	3.50	S_{DS} = 1.203	T_S = 0.336	$C_{s,Design}$ (12.8-2) = **0.516**	
Ω_0 =	3.00	S_{D1} = 0.405	T_o = 0.067	$C_{s,Max}$ (12.8-3 & 4) = 1.345	
C_d =	3.00	$S_{DS,Des}$ = 1.203	☑ No Irregularities?	$C_{s,Min}$ (12.8-5) = 0.010	
				$C_{s,Min,.6g}$ (12.8-6) = 0.130	

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	**$F_{x\ (k)}$**	**$F_{x\ (ASD)}$**	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	12.0	74.2	890	100.0%	**38.26**	**27.33**	2671	14.3	10.2
	Σ=	74.2	890	100%	**38.26**	**27.33**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	38.26	26.78	53.56	**38.26**	**27.33**	14.3	10.2	1.00

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/24/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: (E) Admin Rear (ASCE 7-16 Table 12.2-1/C4)

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 3.50
Ω_0 = 3.00
C_d = 3.00

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.17 sec
T_{Max} = 0.23 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.516**
$C_{s,Max}$ (12.8-3 & 4) = 1.036
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.130

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	17.0	38.8	660	43.4%	**27.94**	**19.95**	1130	24.7	17.7
2nd Flr	10.0	86.1	861	56.6%	**36.45**	**26.04**	1130	32.3	23.0
	Σ=	124.9	1520	100%	**64.39**	**45.99**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph./_{Base}$
Roof	27.94	14.01	28.01	**27.94**	**19.95**	24.7	17.7	1.00
2nd Flr	44.38	31.07	62.13	**44.38**	**31.70**	39.3	28.1	1.22

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/22/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) Admin Front Wd Shearwalls (ASCE 7-16 Table 12.2-1/A15)***

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 6.50
Ω_0 = 3.00
C_d = 4.00

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.13 sec
T_{Max} = 0.18 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.278**
$C_{s,Max}$ (12.8-3 & 4) = 0.724
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.070

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	**$F_{x\ (k)}$**	**$F_{x\ (ASD)}$**	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	12.0	74.2	890	100.0%	**20.60**	**14.71**	2671	7.7	5.5
	Σ=	74.2	890	100%	**20.60**	**14.71**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/Base$
Roof	20.60	26.78	53.56	**26.78**	**19.13**	10.0	7.2	1.30

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/22/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) Admin Rear Wd Shearwalls (ASCE 7-16 Table 12.2-1/A15)***

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 6.50
Ω_0 = 3.00
C_d = 4.00

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.17 sec
T_{Max} = 0.23 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.278**
$C_{s,Max}$ (12.8-3 & 4) = 0.558
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.070

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	17.0	38.8	660	43.4%	**15.04**	**10.74**	1130	13.3	9.5
2nd Flr	10.0	86.1	861	56.6%	**19.63**	**14.02**	1130	17.4	12.4
	Σ=	124.9	1520	100%	**34.67**	**24.76**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	15.04	14.01	28.01	**15.04**	**10.74**	13.3	9.5	1.00
2nd Flr	23.90	31.07	62.13	**31.07**	**22.19**	27.5	19.6	1.58

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

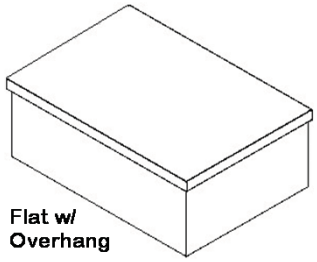
Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

LRFD Wind Design - MWFRS For: (E) Admin Front (ASCE 7-16 Table 12.2-1/A9)

Structure Criteria

Structure Type: All other structural systems
Roof Type: Flat w/Overhang
Roof Pitch: 0.5:12
Structure Ht AGL: 12.0 ft
Mean Rf Ht AGL: 12.0 ft
Add'l Floors AGL: 0 Floors
Eave Ht: 16.0 ft
Least Plan Dim: 40.0 ft
Greatest Plan Dim: 61.7 ft
f_0, (Manual): 0.00 Hz
f_0, (Approx): 7.76 Hz
Flexibility Class: Rigid
Building Class: Class 1
Enclosure Class: Enclosed

Roof Type



Site Criteria

Basic Wind Speed: 110 mph
Exposure Category: D
Directionality Factor, K_d: 0.85
Topographic Factor, K_{zt}: 1.00
Gust Effect Factor, G: 1.00
Internal Press. Coeff, GC_{pi}: 0.18

Procedure Checks:

Torsionally Regular: Yes — **Ch. 27 Part 1 Allowed**
Simple Diaphragm: Yes — **Ch. 27 Part 2 Allowed**
Aprox. Symetrical: Yes — **Ch. 28 Part 1 Allowed**
Flat, Gable Or Hip Roof: Yes — **Ch. 28 Part 2 Allowed**

Definitions (Reference ASCE 7-10, 26.2)

Flexible: Slender buildings that have a fundamental natural frequency less than 1 Hz.

Low Rise: Enclosed or partially enclosed buildings that comply with the following conditions:
1. Mean roof height *h* less than or equal to 60 ft.
2. Mean roof height *h* does not exceed least horizontal dimension.

Simple Diaphragm: A building in which both windward and leeward wind loads are transmitted by roof and vertically spanning wall assemblies, through continuous floo rand roof diaphragms, to the MWFRS.

Torsionally Regular: A bullding with the MWFRS about each principal axis proportioned so that the maximum displacement at each story under Case 2, the torsional wind load case, does not exceed the maximum displacement at the same location under Case 1, the basic wind load case.

Open: A building having each wall at least 80 percent open.

Enclosed: A building that does not comply with the requirements for open or partially enclosed buildings.

Partially Enclosed: A building that complies with both of the following conditions:
1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

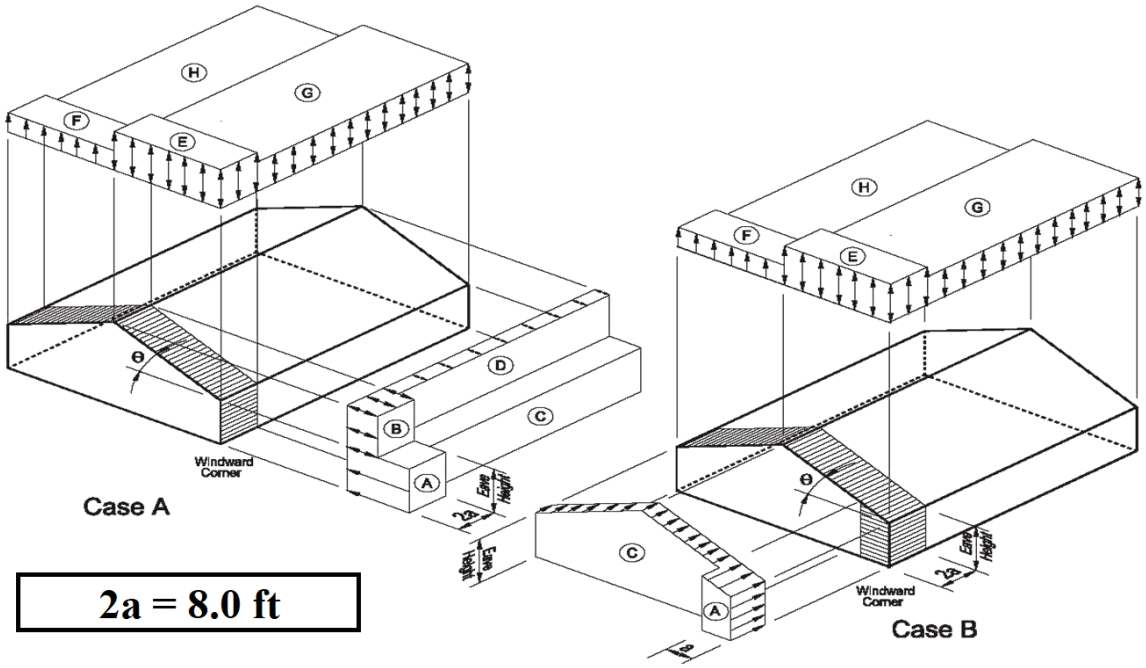
ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) Admin Front (ASCE 7-16 Table 12.2-1/A9)

Wind Zone Pressure Factors	
Basic Wind Speed: 110 mph	Max Structure Ht: 12.0 ft
Exposure Category: D	Roof Slope: 0.0°
Topographic Factor, K_{zt}: 1.00	Adjustment Factor, λ : 1.47

Ht	λ
15.0 ft	1.47
12.0 ft	1.47
15.0 ft	1.47

Load Case: 1

Maximum Envelope Pressures		Horizontal Pressures				Vertical Roof Pressures				Eave Overhangs	
		End Zones		Interior Zones		End Zones		Interior Zones		End	Interior
		Wall	Pitched Rf	Wall	Pitched Rf	Windward	Leeward	Windward	Leeward	Zone	Zone
Wind Zones:		A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
(Below)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_{S30} (psf)	0.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
(Abv)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_S (psf) =		**28.2**	**-14.7**	**18.7**	**-8.7**	**-34.0**	**-19.3**	**-23.5**	**-14.8**	**-47.5**	**-37.2**



2a = 8.0 ft

Notes:
1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m). Adjust to other exposures and heights with adjustment factor λ.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 28.4-1)
3. For Case B use $\theta = 0°$.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° and 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_S = 0$ in zones B & D.
8. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
9. Notation:
   a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
   h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
   θ: Angle of plane of roof from horizontal, in degrees.

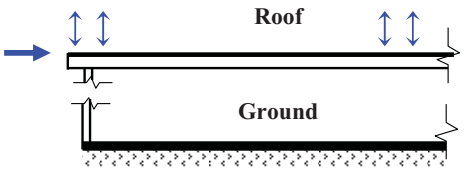
Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) Admin Front (ASCE 7-16 Table 12.2-1/A9)

This sheet provides a summary of all wind forces at the lvels indicated, based on Part 2 of the envelope procedure as indicated in the previous pages. Gable or parapet loads, where applicable, are included in the main roof level loads.

	LRFD	ASD	Uplift End Zone	Uplift Typ Int
			34.0 psf	**23.5 psf**
			20.4 psf (ASD)	**14.1 psf (ASD)**
Roof Typ Int	**149 plf**	**90 plf**		
Roof EZ Add'l	**612 lbs**	**367 lbs**		



Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

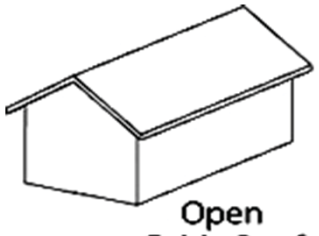
LRFD Wind Design - MWFRS For: (E) Admin Rear (ASCE 7-16 Table 12.2-1/A9)

Structure Criteria

Structure Type: All other structural systems
Roof Type: Gable, Open
Roof Pitch: 4.0:12
Structure Ht AGL: 23.7 ft
Mean Rf Ht AGL: 19.8 ft
Add'l Floors AGL: 1 Floors
Least Plan Dim: 28.3 ft
Greatest Plan Dim: 40.0 ft
f_0, (Manual): 0.00 Hz
f_0, (Approx): 5.32 Hz
Flexibility Class: Rigid
Building Class: Class 1
Enclosure Class: Enclosed

Roof Ht: 23.7 ft
Eave Ht: 17.0 ft
Level 2 : 8.7 ft

Roof Type



Site Criteria

Basic Wind Speed: 110 mph
Exposure Category: D
Directionality Factor, K_d: 0.85
Topographic Factor, K_{zt}: 1.00
Gust Effect Factor, G: 1.00
Internal Press. Coeff, GC_{pi}: 0.18

Procedure Checks:

Torsionally Regular: Yes
Simple Diaphragm: Yes
Aprox. Symetrical: Yes
Flat, Gable Or Hip Roof: Yes

Ch. 27 Part 1 Allowed
Ch. 27 Part 2 Allowed
Ch. 28 Part 1 Allowed
Ch. 28 Part 2 Allowed

Definitions (Reference ASCE 7-10, 26.2)

Flexible: Slender buildings that have a fundamental natural frequency less than 1 Hz.

Low Rise: Enclosed or partially enclosed buildings that comply with the following conditions:
1. Mean roof height *h* less than or equal to 60 ft.
2. Mean roof height *h* does not exceed least horizontal dimension.

Simple Diaphragm: A building in which both windward and leeward wind loads are transmitted by roof and vertically spanning wall assemblies, through continuous floo rand roof diaphragms, to the MWFRS.

Torsionally Regular: A bullding with the MWFRS about each principal axis proportioned so that the maximum displacement at each story under Case 2, the torsional wind load case, does not exceed the maximum displacement at the same location under Case 1, the basic wind load case.

Open: A building having each wall at least 80 percent open.

Enclosed: A building that does not comply with the requirements for open or partially enclosed buildings.

Partially Enclosed: A building that complies with both of the following conditions:
1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

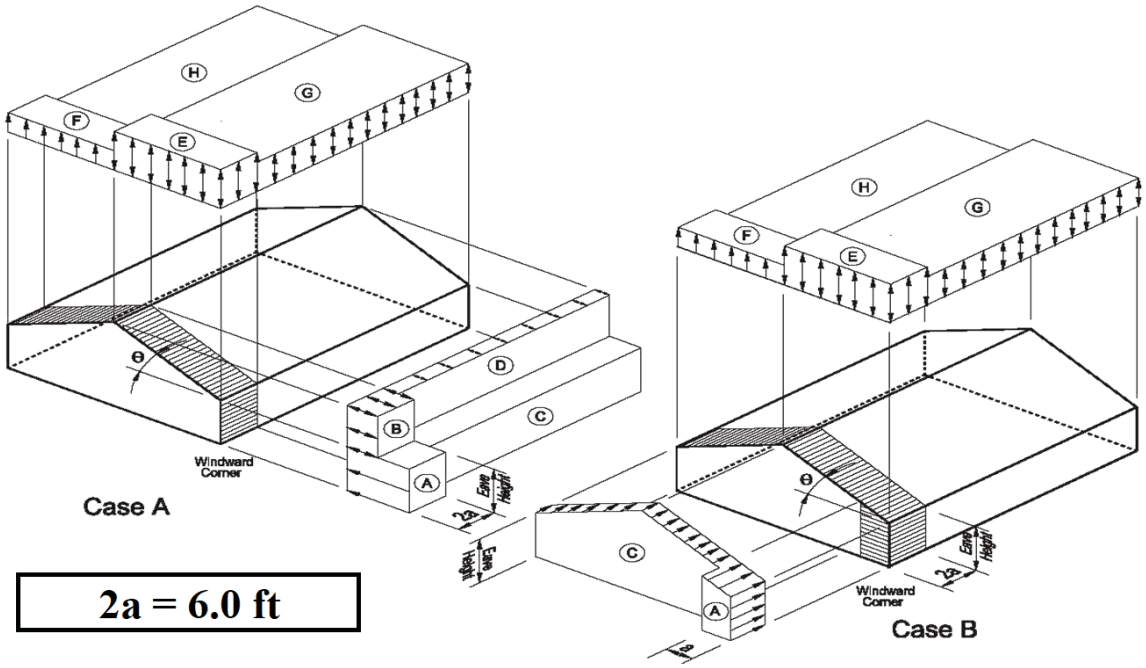
ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) Admin Rear (ASCE 7-16 Table 12.2-1/A9)

Wind Zone Pressure Factors	
Basic Wind Speed: 110 mph	Mean Roof Ht: 23.7 ft
Exposure Category: D	Roof Slope: 18.4°
Topographic Factor, K_{zt}: 1.00	Adjustment Factor, λ : 1.59

Ht	λ
20.0 ft	1.55
23.7 ft	1.59
25.0 ft	1.61

Load Case: 1

Maximum Envelope Pressures		Horizontal Pressures				Vertical Roof Pressures				Eave Overhangs	
		End Zones		Interior Zones		End Zones		Interior Zones		End	Interior
		Wall	Pitched Rf	Wall	Pitched Rf	Windward	Leeward	Windward	Leeward	Zone	Zone
Wind Zones:		A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
(Below)	15.0°	24.1	-8.0	16.0	-4.6	-23.1	-15.1	-16.0	-11.5	-32.3	-25.3
P_{S30} (psf)	18.4°	25.8	-7.3	17.2	-4.1	-23.1	-15.1	-16.0	-11.5	-32.3	-25.3
(Abv)	20.0°	26.6	-7.0	17.7	-3.9	-23.1	-16.0	-16.0	-12.2	-32.3	-25.3
P_S (psf) =		**41.2**	**-11.7**	**27.4**	**-6.6**	**-36.8**	**-24.1**	**-25.5**	**-18.3**	**-51.5**	**-40.3**



2a = 6.0 ft

Notes:
1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m). Adjust to other exposures and heights with adjustment factor λ.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 28.4-1)
3. For Case B use $\theta = 0°$.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° and 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_S = 0$ in zones B & D.
8. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
9. Notation:
   a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
   h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
   θ: Angle of plane of roof from horizontal, in degrees.

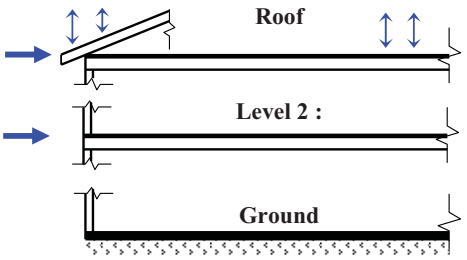
Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) Admin Rear (ASCE 7-16 Table 12.2-1/A9)

This sheet provides a summary of all wind forces at the lvels indicated, based on Part 2 of the envelope procedure as indicated in the previous pages. Gable or parapet loads, where applicable, are included in the main roof level loads.

	LRFD	ASD	Uplift End Zone	Uplift Typ Int
Gable End Int	**91 plf**	**55 plf**	**36.8 psf**	**25.5 psf**
Gable End EZ Add'l	**276 lbs**	**166 lbs**	**22.1 psf (ASD)**	**15.3 psf (ASD)**
Roof Typ Int	**158 plf**	**95 plf**		
Roof EZ Add'l	**548 lbs**	**329 lbs**		
Level 2 : Typ Int	**233 plf**	**140 plf**		
Level 2 : EZ Add'l	**703 lbs**	**422 plf**		



South Wing
Demand

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Loads for: (E) South Wing

Typ Roof Dead Load	psf
Roofing	4.0
Rf Sht'g	1.5
Framing	1.0
Ceiling Finish	2.2
Misc	1.3
	10.0

Ext Wall Dead Load	psf
Siding	3.0
Wall Sht'g	1.5
2x6 @ 16"	1.6
Gyp Board	2.2
Misc	1.7
	10.0

Roof Live (0.5:12) 20.0

Seismic Mass

Roof Seismic Mass

$Slope_{Roof}$ = 1:12
$Dl_{add'l\ (part)}$ = 0.0 psf
$Snow_{(20\%)}$ = 0.0 psf
Roof Area = 3790.0 sf
Perimeter = 250 ft
$h\text{-}trib_{wall}$ = 8.0 ft
W_{EQ} = 213.7 k

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) South Wing (ASCE 7-16 Table 12.2-1/A9)***

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 2.00
Ω_0 = 2.50
C_d = 1.75

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.16 sec
T_{Max} = 0.22 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.902**
$C_{s,Max}$ (12.8-3 & 4) = 1.897
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.228

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	16.0	239.9	3839	100.0%	**216.50**	**154.64**	3790	57.1	40.8
	Σ=	239.9	3839	100%	**216.50**	**154.64**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/Base$
Roof	216.50	86.60	173.20	**173.20**	**123.71**	45.7	32.6	0.80

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/22/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) South Wing Moment Frames (ASCE 7-16 Table 12.2-1/C4)***

LFRS:	All other bldgs	S_S = 1.504	T_{modal} = 0.00 sec	☐ Extreme Torsion Irregularity?	
Occupancy:	IV	S_1 = 0.607	T_L = 12.00 sec	☑ >35%V Complies w/Table 12.3-3?	
Site Class:	D-Default	F_a = 1.200	T_a = 0.16 sec	☑ Regular in plan at all levels?	
I_{EQ} =	1.50	F_v = 1.000	T_{Max} = 0.22 sec	☑ 2 bays ES Ea Direction?	
R-Factor =	3.50	S_{DS} = 1.203	T_S = 0.336	$C_{s,Design}$ (12.8-2) = **0.516**	
Ω_0 =	3.00	S_{D1} = 0.405	T_o = 0.067	$C_{s,Max}$ (12.8-3 & 4) = 1.084	
C_d =	3.00	$S_{DS,Des}$ = 1.203	☑ No Irregularities?	$C_{s,Min}$ (12.8-5) = 0.010	
				$C_{s,Min,.6g}$ (12.8-6) = 0.130	

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	**$F_{x\ (k)}$**	**$F_{x\ (ASD)}$**	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	16.0	239.9	3839	100.0%	**123.71**	**88.37**	3790	32.6	23.3
	Σ=	239.9	3839	100%	**123.71**	**88.37**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	123.71	86.60	173.20	**123.71**	**88.37**	32.6	23.3	1.00

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

Date: **3/22/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

Seismic Load Criteria for: ***(E) South Wing Wd Shearwalls (ASCE 7-16 Table 12.2-1/A15)***

LFRS: All other bldgs
Occupancy: IV
Site Class: D-Default
I_{EQ} = 1.50
R-Factor = 6.50
Ω_0 = 3.00
C_d = 4.00

S_S = 1.504
S_1 = 0.607
F_a = 1.200
F_v = 1.000
S_{DS} = 1.203
S_{D1} = 0.405
$S_{DS,Des}$ = 1.203

T_{modal} = 0.00 sec
T_L = 12.00 sec
T_a = 0.16 sec
T_{Max} = 0.22 sec
T_S = 0.336
T_o = 0.067
☑ No Irregularities?

☐ Extreme Torsion Irregularity?
☑ >35%V Complies w/Table 12.3-3?
☑ Regular in plan at all levels?
☑ 2 bays ES Ea Direction?

$C_{s,Design}$ (12.8-2) = **0.278**
$C_{s,Max}$ (12.8-3 & 4) = 0.584
$C_{s,Min}$ (12.8-5) = 0.010
$C_{s,Min,.6g}$ (12.8-6) = 0.070

Base Shear & Story Distribution

SEISMIC DESIGN CATEGORY 'D' (Dynamic Procedure Not Required) ρ = 1.0 Exp 'k' = 1.00

$Level_x$	$h_{x\ (ft)}$	$W_{x\ (k)}$	$W_x h_x^k$	$W_x h_x^k / \Sigma W_i h_i^k$	$F_{x\ (k)}$	$F_{x\ (ASD)}$	A_{flr} (sf)	w_{EQ} (psf)	$w_{EQ\ (ASD)}$
Roof	16.0	239.9	3839	100.0%	**66.62**	**47.58**	3790	17.6	12.6
	Σ=	239.9	3839	100%	**66.62**	**47.58**			

Diaphragm Loading

$Level_x$	$F_{px\ (k)}$	$F_{px\text{-}min}$	$F_{px\text{-}max}$	$F_{px\ (k)}$	$F_{px\ (ASD)}$	w_{EQ} (psf)	$w_{EQ\ (ASD)}$	$Diaph/_{Base}$
Roof	66.62	86.60	173.20	**86.60**	**61.86**	22.8	16.3	1.30

Vertical Seismic Demand

$E_v = 0.2 \times S_{DS} \times D = 0.24 \times D$

Out-Of-Plane Demand

☑ Conc./Masonry Walls
☑ Flexible Diaphragm

	Walls	Anchorage	Anchorage to Concrete
LRFD	0.72Wp	1.44Wp (722 plf min)	0.89Wp (444 plf min)
ASD	0.52Wp	1.03Wp (516 plf min)	0.63Wp (317 plf min)

Covenant Engineering

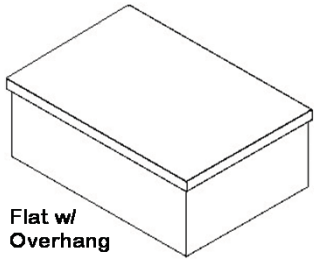
Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

LRFD Wind Design - MWFRS For: (E) South Wing (ASCE 7-16 Table 12.2-1/A9)

Structure Criteria

Structure Type: All other structural systems
Roof Type: Flat w/Overhang
Roof Pitch: 0.5:12
Structure Ht AGL: 17.0 ft
Mean Rf Ht AGL: 16.5 ft
Add'l Floors AGL: 0 Floors
Eave Ht: 16.0 ft
Least Plan Dim: 50.0 ft
Greatest Plan Dim: 75.8 ft
f_0, (Manual): 0.00 Hz
f_0, (Approx): 6.11 Hz
Flexibility Class: Rigid
Building Class: Class 1
Enclosure Class: Enclosed

Roof Type



Site Criteria

Basic Wind Speed: 110 mph
Exposure Category: D
Directionality Factor, K_d: 0.85
Topographic Factor, K_{zt}: 1.00
Gust Effect Factor, G: 1.00
Internal Press. Coeff, GC_{pi}: 0.18

Procedure Checks:

Torsionally Regular: Yes — **Ch. 27 Part 1 Allowed**
Simple Diaphragm: Yes — **Ch. 27 Part 2 Allowed**
Aprox. Symetrical: Yes — **Ch. 28 Part 1 Allowed**
Flat, Gable Or Hip Roof: Yes — **Ch. 28 Part 2 Allowed**

Definitions (Reference ASCE 7-10, 26.2)

Flexible: Slender buildings that have a fundamental natural frequency less than 1 Hz.

Low Rise: Enclosed or partially enclosed buildings that comply with the following conditions:
1. Mean roof height *h* less than or equal to 60 ft.
2. Mean roof height *h* does not exceed least horizontal dimension.

Simple Diaphragm: A building in which both windward and leeward wind loads are transmitted by roof and vertically spanning wall assemblies, through continuous floo rand roof diaphragms, to the MWFRS.

Torsionally Regular: A bullding with the MWFRS about each principal axis proportioned so that the maximum displacement at each story under Case 2, the torsional wind load case, does not exceed the maximum displacement at the same location under Case 1, the basic wind load case.

Open: A building having each wall at least 80 percent open.

Enclosed: A building that does not comply with the requirements for open or partially enclosed buildings.

Partially Enclosed: A building that complies with both of the following conditions:
1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

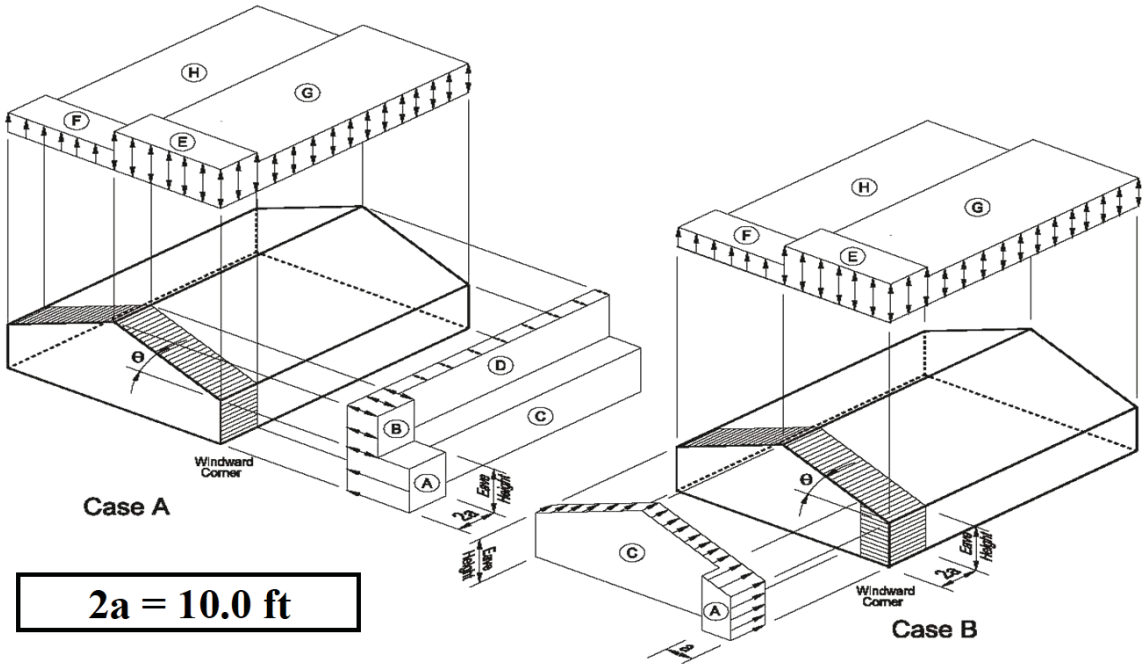
ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) South Wing (ASCE 7-16 Table 12.2-1/A9)

Wind Zone Pressure Factors	
Basic Wind Speed: 110 mph	Max Structure Ht: 17.0 ft
Exposure Category: D	Roof Slope: 0.0°
Topographic Factor, K_{zt}: 1.00	Adjustment Factor, λ : 1.50

Ht	λ
15.0 ft	1.47
17.0 ft	1.50
20.0 ft	1.55

Load Case: 1

Maximum Envelope Pressures		Horizontal Pressures				Vertical Roof Pressures				Eave Overhangs	
		End Zones		Interior Zones		End Zones		Interior Zones		End	Interior
		Wall	Pitched Rf	Wall	Pitched Rf	Windward	Leeward	Windward	Leeward	Zone	Zone
Wind Zones:		A	B	C	D	E	F	G	H	E_{OH}	G_{OH}
(Below)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_{S30} (psf)	0.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
(Abv)	5.0°	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
P_S (psf) =		**28.8**	**-15.0**	**19.1**	**-8.9**	**-34.7**	**-19.7**	**-24.0**	**-15.2**	**-48.5**	**-38.0**



2a = 10.0 ft

Notes:
1. Pressures shown are applied to the horizontal and vertical projections, for exposure B, at h=30 ft (9.1m). Adjust to other exposures and heights with adjustment factor λ.
2. The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 28.4-1)
3. For Case B use $\theta = 0°$.
4. Load cases 1 and 2 must be checked for $25° < \theta \leq 45°$. Load case 2 at 25° is provided only for interpolation between 25° and 30°.
5. Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
6. For roof slopes other than those shown, linear interpolation is permitted.
7. The total horizontal load shall not be less than that determined by assuming $p_S = 0$ in zones B & D.
8. Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
9. Notation:
   a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
   h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
   θ: Angle of plane of roof from horizontal, in degrees.

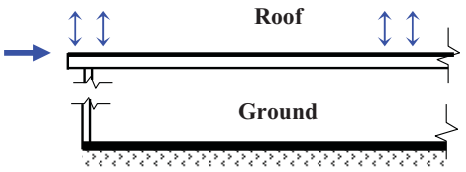
Covenant Engineering

Date: **3/21/2023**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire Station**

ASCE 7-27 Part 2 Enclosed Simple Diaphragm Buildings For: (E) South Wing (ASCE 7-16 Table 12.2-1/A9)

This sheet provides a summary of all wind forces at the lvels indicated, based on Part 2 of the envelope procedure as indicated in the previous pages. Gable or parapet loads, where applicable, are included in the main roof level loads.

	LRFD	ASD	Uplift End Zone	Uplift Typ Int
			34.7 psf	**24.0 psf**
			20.8 psf (ASD)	**14.4 psf (ASD)**
Roof Typ Int	**153 plf**	**92 plf**		
Roof EZ Add'l	**781 lbs**	**469 lbs**		



(E) SOUTH STEEL OMF DEMAND

- GRAVITY

P_{D1} = 43 plf (23'-4) = 1003#
10 psf (23'-4)(8'-5) = 1964#
Σ = 2967#

P_{Lr1} = 20 psf (23'-4)(8'-5)(0.6) = 2357#

P_{D2} = 43 plf (23'-4) = 1003#
10 psf (23'-4)(8'-2) = 1906#
Σ = 2909#

P_{Lr2} = 20 psf (23'-4)(8'-2)(0.6) = 2287#

- LATERAL - STL OMF R-VALUE SEISMIC

w_E = ½(123.71K) / 47.9' = 1.291 klf OR 1291 plf

- LATERAL - CMU R-VALUE SEISMIC

w_E = ½(216.50K / 47.9' = 2.260 Klf OR 2260 plf

- LATERAL - WIND

w_W = [153 plf (½)(70') + 469#] / 47.9' = 122 plf

Masonry Shear Walls
North Wing
(R = 2.0)

(E) NORTH WING

- FRONT N-S LINE

$V_E = \frac{1}{2}(193.72^k) = 96.86^k = 96860^{\#}$

$V_W = 109\,plf\,(\frac{1}{2})(58') + 561^{\#} = 3722^{\#}$

$\Sigma SW_{CONC} = 9.67'$

$V_{SW} = \frac{96860^{\#}}{9.67'} = 10016\,plf \quad (7011\,plf\ ASD)$

- MIDDLE N-S LINE

$V_E = \frac{1}{2}(193.72^k + 84.72^k) = 139.22^k = 139220^{\#}$

$V_W = 109\,plf\,(\frac{1}{2})(58') + 73\,plf\,(\frac{1}{2})(36'6) = 4493^{\#}$

$\Sigma SW_{CMU} = 39.33'$

$V_{SW} = \frac{139220^{\#}}{39.33'} = 3540\,plf \quad (2478\,plf\ ASD)$

- REAR N-S LINE

$V_E = \frac{1}{2}(84.72^k) = 42.36^k = 42360^{\#}$

$V_W = 73\,plf\,(\frac{1}{2})(36'6) + 267^{\#} = 1599^{\#}$

$\Sigma SW_{CMU} = 34.5'$

$V_{SW} = \frac{42360^{\#}}{34.5'} = 1228\,plf \quad (859\,plf\ ASD)$

(E) North Wind Cont'd

- Ext. E-W Line

$V_E = \frac{1}{2}(193.72^k + 84.72^k) = 139.22^k = 139220^{\#}$

$V_W = 109\,plf\,(\frac{1}{2})(50') + 561^{\#} = 3722^{\#}$

$\Sigma SW_{CMU} = 43.33'$ (Wall length < 2'-0 not incl.)

$V_{SW} = \frac{139220^{\#}}{43.33'} = 3213\,plf$ (2249 plf ASD)

- Int. E-W Line, Not Incl. Admin Contributions

$V_E = \frac{1}{2}(193.72^k + 84.72^k) = 139.22^k = 139220^{\#}$

$V_W = 109\,plf\,(\frac{1}{2})(50') = 2725^{\#}$

$\Sigma SW_{CMU} = 61.42'$

$V_{SW} = \frac{139220^{\#}}{61.42'} = 2267\,plf$ (1587 plf ASD)

- Int E-W Line, Incl. Admin Contributions

$V_E = \frac{1}{2}(193.72^k + 84.72^k + 66.95^k + 112.68^k) = 229.04^k = 229040^{\#}$

$V_W = 109\,plf\,(\frac{1}{2})(50') + (95\,plf + 140\,plf)(\frac{1}{2})(40') + 329^{\#} = 7754^{\#}$

$\Sigma SW_{CMU} = 61.42'$

$V_{SW} = \frac{229040^{\#}}{61.42'} = 3729\,plf$ (2610 plf ASD)

CHECK CMU SHEAR STRESSES

- ASSUME:
  - FULLY GROUTED
  - CMU DOWELED TO CONC ELEMENTS
  - COMPLIES W/ ORDINARY (TYP EA), MIN.

- FRONT N-S LINE - CONC. OMF, OTHER ISSUES BESIDES SHEAR EXIST.

$A_v = 12"(18" + 24" + 32" + 24" + 18") = 1392 in^2$

$\sigma_v = \frac{96860\#}{1392 in^2} = 69.6 psi$

- MIDDLE N-S LINE

$A_v = 7.625"(144" + 140" + 114" + 74") = 3599 in^2$

$\sigma_v = \frac{139220\#}{3599 in^2} = 38.7 psi$

- REAR N-S LINE

$A_v = 7.625"(56" + 102" + 53" + 46" + 81" + 76") = 3157 in^2$

$\sigma_v = \frac{42360\#}{3157 in^2} = 13.4 psi$

- EXT. E-W LINE

$A_v = 7.625"(123" + 77" + 64" + 27" + 62" + 72" + 69" + 26") = 3965 in^2$

$\sigma_v = \frac{139220\#}{3965 in^2} = 35.1 psi$

- INT. E-W LINE

$A_v = 7.625"(58" + 90" + 208" + 48" + 112" + 66" + 54") = 5216 in^2$

$\sigma_v = \frac{139220\#}{5216 in^2} = 26.7 psi$

σ_v (w/ ADMIN CONTROLS) $= \frac{229040\#}{5216 in^2} = 43.9 psi$

Wood Shear Walls
Admin & South Wing
(R = 2.0)

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

Lateral Shearwall Design Summary

Level	Line	Method	v_{SW} (plf)	SW	v_{Dia} (plf)	F_{HD} (lbs)	HD	F_{strap} (lbs)	Strap	Orient
2nd Flr	2	SEGMENT	624	n/a	355	2214	n/a	n/a	n/a	n/a
"	4	SEGMENT	624	n/a	355	2214	n/a	n/a	n/a	n/a
"	A	SEGMENT	566	n/a	246	4572	n/a	n/a	n/a	n/a
"	C	SEGMENT	722	n/a	246	5779	n/a	n/a	n/a	n/a
1st Flr	1	SEGMENT	1611	n/a	1071	24791	n/a	n/a	n/a	n/a
"	2	SEGMENT	2413	n/a	1845	29410	n/a	n/a	n/a	n/a
"	3	SEGMENT	1437	n/a	362	18715	n/a	n/a	n/a	n/a
"	4	SEGMENT	1041	n/a	674	11849	n/a	n/a	n/a	n/a
"	A	SEGMENT	1166	n/a	963	13364	n/a	n/a	n/a	n/a
"	C	SEGMENT	1857	n/a	988	22087	n/a	n/a	n/a	n/a
"	E	SEGMENT	1299	n/a	535	17518	n/a	n/a	n/a	n/a

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Lateral Load Line Reactions

Level: 2nd Flr Walls Perp To Eaves

Line ID	WIND	w (plf) = 95 plf EZ_{wind} = 329 lbs		SEISMIC w_{EQ} = 30.9 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	20.25	Yes	**2.25**	565.00	**17.46**
4	20.25	Yes	**2.25**	565.00	**17.46**

Level: 2nd Flr Walls Perp To Gables

Line ID	WIND	w (plf) = 55 plf EZ_{wind} = 166 lbs		SEISMIC w_{EQ} = 30.9 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
A	14.00	Yes	**0.94**	565.00	**17.46**
C	14.00	Yes	**0.94**	565.00	**17.46**

Level: 1st Flr Below 2nd Flr

Line ID	WIND	w (plf) = 140 plf EZ_{wind} = 422 lbs		SEISMIC w_{EQ} = 40.3 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	20.25	Yes	**3.26**	565.00	**22.77**
4	20.25	No	**2.84**	565.00	**22.77**
A	9.00	Yes	**1.68**	565.00	**22.77**
C	20.00	Yes	**3.22**	565.00	**22.77**

Level: 1st Flr Below Flat Rf

Line ID	WIND	w (plf) = 90 plf EZ_{wind} = 367 lbs		SEISMIC w_{EQ} = 17.9 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	19.50	Yes	**2.12**	871.00	**15.59**
3	6.00	Yes	**0.91**	375.00	**6.71**
4	6.00	Yes	**0.91**	1246.00	**22.30**
E	1.00	Yes	**0.46**	1246.00	**22.30**

Level: South Wing

Line ID	WIND	w (plf) = 92 plf EZ_{wind} = 469 lbs		SEISMIC w_{EQ} = 40.8 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
1	25.00	Yes	**2.77**	1895.00	**77.32**
2	25.00	No	**2.30**	1895.00	**77.32**

REACTION SUMMARY - 2nd FLOOR

Line ID	**Σ W (k)**	**Σ EQ (k)**
2	2.25	17.46
4	2.25	17.46
A	0.94	17.46
C	0.94	17.46

REACTION SUMMARY - 1st FLOOR

Line ID	**Σ W (k)**	**Σ EQ (k)**
1	2.77	77.32
2	9.93	133.13
3	0.91	6.71
4	5.99	62.53
A	2.62	40.23
C	4.16	40.23
E	0.46	22.30

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 2 @ 2nd Flr (R=2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **2** @ **2nd Flr (R=2.0)**

EQ Modifiers	2nd Flr (R=2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2253#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **17459#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **21.3 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented   SW ☐ LRFD?
○ Perforated   Diaph ☐ LRFD?
C_0 = 1.00
\# bays = 7.0

Diaphragm:	Shearwall:
l_{dia} = 28.00 ft	l_{sw} = 28.00 ft
v_{dia} = **355 plf**	v_{sw} = **624 plf**
$F_{coll-max}$ = **0#**	Δ_{sw} = 0.23 in

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**
Shear Wall: **Other Grades 15/32 w/8d, EN@2"oc, (640plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	28.00	OK	0	--- ---	131.32	18.02	--- ---	-2210 -2210	139.67	--- ---	2214 2214			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 4 @ 2nd Flr (R=2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **4** @ **2nd Flr (R=2.0)**

EQ Modifiers	2nd Flr (R=2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2253#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **17459#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **21.3 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated; SW ☐ LRFD?; Diaph ☐ LRFD?
C_0 = 1.00
bays = 7.0

Diaphragm:	Shearwall:
l_{dia} = 28.00 ft	l_{sw} = 28.00 ft
v_{dia} = **355 plf**	v_{sw} = **624 plf**
$F_{coll-max}$ = **0#**	Δ_{sw} = 0.23 in

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**
Shear Wall: **Other Grades 15/32 w/8d, EN@2"oc, (640plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	28.00	OK	0	--- ---	131.32	18.02	--- ---	-2210 -2210	139.67	--- ---	2214 2214			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 2nd Flr (R=2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **2nd Flr (R=2.0)**

EQ Modifiers	2nd Flr (R=2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **17459#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 7.7

Diaphragm:	Shearwall:
l_{dia} = 40.51 ft	l_{sw} = 30.84 ft
v_{dia} = **246 plf**	v_{sw} = **566 plf**
$F_{coll\text{-}max}$ = **3199#**	Δ_{sw} = 0.33 in

Diaphragm: **Unblocked (Case 1), C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (240plf)**

Shear Wall: **Other Grades 15/32 w/8d, EN@2"oc, (640plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type Anchor-Bolt	Minimum Holdown Type Foundation Strap	Minimum Holdown Type Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	7.17	OK	969	--- ---	3.29	1.74	--- ---	-35 -174	32.47	--- ---	4572 4433			
Open		9.67	---	-3199	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.67	OK	0	--- ---	35.86	5.75	--- ---	-820 -681	107.20	--- ---	3559 3698			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 2nd Flr (R=2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **2nd Flr (R=2.0)**

EQ Modifiers	2nd Flr (R=2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **17459#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated — SW ☐ LRFD? — Diaph ☐ LRFD?

C_0 = 1.00

\# bays = 6.0

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 24.17 ft
v_{dia} = **246 plf**	v_{sw} = **722 plf**
$F_{coll-max}$ = **4514#**	Δ_{sw} = 0.34 in

Diaphragm: **Unblocked (Case 1), C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (240plf)**

Shear Wall: **Other Grades 15/32 w/10d, EN@2"oc, (770plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	8.67	OK	2525	--- / ---	4.81	2.69	--- / ---	-25 / -260	50.10	--- / ---	5779 / 5544			
Open		16.33	---	-4514	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	15.50	OK	0	--- / ---	15.38	4.80	--- / ---	-530 / -295	89.57	--- / ---	5121 / 5356			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 1 @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **1** @ **1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2769#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **77316#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **16.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented SW ☐ LRFD?
○ Perforated Diaph ☐ LRFD?
C_0 = 1.00
bays = 6.0

Diaphragm:	Shearwall:
l_{dia} = 70.00 ft	l_{sw} = 48.00 ft
v_{dia} = **1071 plf**	v_{sw} = **1611 plf**
$F_{coll\text{-}max}$ = **12150#**	Δ_{sw} = #N/A

Diaphragm: **n/aC-C, C-D 15/32 w/8d o/2x Nom. Framingn/an/aplf)**
Shear Wall: **########**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	24.00	OK	12150	--- ---	59.90	22.15	--- ---	-587 -904	618.53	--- ---	24791 24474			
Open		22.00	---	-12150	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	24.00	OK	0	--- ---	59.90	22.15	--- ---	-904 -587	618.53	--- ---	24474 24791			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 2 @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **2** @ **1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **9932#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **133135#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **16.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **21.3 ft**

◉ Segmented ○ Perforated
SW ☐ LRFD?
Diaph ☐ LRFD?
C_0 = 1.00
\# bays = 6.9

Diaphragm:	Shearwall:
l_{dia} = 70.00 ft	l_{sw} = 55.17 ft
v_{dia} = **1845 plf**	v_{sw} = **2413 plf**
$F_{coll-max}$ = **18068#**	Δ_{sw} = #N/A

Diaphragm: **n/aC-C, C-D 15/32 w/8d o/2x Nom. Framingn/an/aplf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		5.33	---	-10137	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	55.17	OK	18068	--- / ---	826.37	158.91	--- / ---	-6647 / -6708	2130.16	--- / ---	29410 / 29349			
Open		6.00	---	6657	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.50	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 3 @ 1st Flr (R-2.0)

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **907#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **6713#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

(●) Segmented
( ) Perforated
C_0 = 1.00
bays = 0.8

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 17.99 ft	l_{sw} = 4.67 ft
v_{dia} = **362 plf**	v_{sw} = **1437 plf**
$F_{coll-max}$ = **2858#**	Δ_{sw} = #N/A

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 3.5:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	1.33	---	-496	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		4.33	---	-2112	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.67	OK	2858	--- ---	2.88	10.88	--- ---	2009 2009	80.55	--- ---	18715 18715			
Open		4.33	---	1243	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.33	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 4 @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **4** @ **1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **5995#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **62531#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **21.3 ft**

◉ Segmented ○ Perforated SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 10.0

Diaphragm:	Shearwall:
l_{dia} = 90.00 ft	l_{sw} = 60.09 ft
v_{dia} = **674 plf**	v_{sw} = **1041 plf**
$F_{coll\text{-}max}$ = **10148#**	Δ_{sw} = #N/A

Diaphragm: **n/aC-C, C-D 15/32 w/8d o/2x Nom. Framingn/an/aplf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	13.67	OK	4728	--- ---	47.00	16.37	--- ---	-899 -1217	170.70	--- ---	10821 10502			
Open		3.50	---	2296	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	7.50	OK	4890	--- ---	14.15	8.98	--- ---	-248 -278	93.66	--- ---	11849 11819			
Open		3.83	---	2229	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	21.42	OK	9636	--- ---	115.39	25.64	--- ---	-2432 -2386	267.48	--- ---	9128 9174			
Open		3.33	---	7323	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	8.17	OK	10148	--- ---	16.79	9.78	--- ---	-341 -583	102.02	--- ---	11686 11443			
Open		6.00	---	5979	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	9.33	OK	9206	--- ---	21.89	11.17	--- ---	-768 -927	116.51	--- ---	11162 11003			
Open		7.75	---	3821	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	5.50	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above		
ρ = **1.00**	V_{wind} = **2618#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**	
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **40228#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**	
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**	

◉ Segmented ○ Perforated
SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 5.8

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 34.50 ft
v_{dia} = **963 plf**	v_{sw} = **1166 plf**
$F_{coll-max}$ = **4117#**	Δ_{sw} = #N/A

Diaphragm: **n/aC-C, C-D 15/32 w/8d o/2x Nom. Framingn/an/aplf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.67	OK	1843	--- ---	22.31	9.72	--- ---	-361 -707	149.30	--- ---	13364 13018			
Open		6.00	---	-4117	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.83	OK	0	--- ---	111.30	21.70	--- ---	-2278 -1932	333.44	--- ---	11084 11430			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---		---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **4158#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **40228#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**

◉ Segmented ○ Perforated
SW ☐ LRFD?
Diaph ☐ LRFD?
C_0 = 1.00
\# bays = 3.6

Diaphragm:	Shearwall:
l_{dia} = 39.49 ft	l_{sw} = 21.66 ft
v_{dia} = **988 plf**	v_{sw} = **1857 plf**
$F_{coll-max}$ = **9291#**	Δ_{sw} = #N/A

Diaphragm: **n/aC-C, C-D 15/32 w/8d o/2x Nom. Framingn/an/aplf)**
Shear Wall: **########**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	11.08	OK	9291	--- ---	24.06	25.52	--- ---	1048 21	246.94	--- ---	21976 20949			
Open		17.83	---	-8872	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.58	OK	0	--- ---	21.94	24.37	--- ---	85 1112	235.80	--- ---	21060 22087			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=2.0)**

ASD Diaphragm/ASD Shearwall Design for Grid Line E @ 1st Flr (R-2.0)

ASD Diaphragm/ASD Shearwall Design for Grid Line **E @ 1st Flr (R-2.0)**

EQ Modifiers	1st Flr (R-2.0)		Level(s) Above	
ρ = **1.00**	V_{wind} = **457#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.80**	V_{EQ} = **22303#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **8.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated — SW ☐ LRFD? — Diaph ☐ LRFD?
C_0 = 1.00
bays = 2.9

Diaphragm:	Shearwall:
l_{dia} = 33.33 ft	l_{sw} = 17.17 ft
v_{dia} = **535 plf**	v_{sw} = **1299 plf**
$F_{coll\text{-}max}$ = **5019#**	Δ_{sw} = #N/A

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@2.5", EN@4" (530plf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 3.5:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.17	---	-2121	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		4.33	---	-5019	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	9.00	OK	649	--- ---	8.75	2.87	--- ---	-404 -404	140.29	--- ---	15762 15762			
Open		4.33	---	-2248	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.17	OK	378	--- ---	1.88	1.33	--- ---	-69 -69	65.00	--- ---	17280 17280			
Open		4.33	---	-2519	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.00	OK	0	--- ---	1.73	1.28	--- ---	-56 69	62.35	--- ---	17394 17518			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Wood Shear Walls
Admin & South Wing
(R = 3.5)

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

Lateral Shearwall Design Summary

Level	Line	Method	v_{SW} (plf)	SW	v_{Dia} (plf)	F_{HD} (lbs)	HD	F_{strap} (lbs)	Strap	Orient
2nd Flr	A	SEGMENT	324	n/a	141	2493	n/a	n/a	n/a	n/a
"	C	SEGMENT	414	n/a	141	3159	n/a	n/a	n/a	n/a
1st Flr	A	SEGMENT	667	n/a	551	7075	n/a	n/a	n/a	n/a
"	C	SEGMENT	1062	n/a	565	12066	n/a	n/a	n/a	n/a
"	E	SEGMENT	740	n/a	305	9855	n/a	n/a	n/a	n/a

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Lateral Load Line Reactions

Level: 2nd Flr Walls Perp To Gables

Line ID	WIND	w (plf) = 55 plf EZ_{wind} = 166 lbs		SEISMIC w_{EQ} = 17.7 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
A	14.00	Yes	**0.94**	565.00	**10.00**
C	14.00	Yes	**0.94**	565.00	**10.00**

Level: 1st Flr Below 2nd Flr (R=6.5)

Line ID	WIND	w (plf) = 140 plf EZ_{wind} = 422 lbs		SEISMIC w_{EQ} = 23.0 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
A	9.00	Yes	**1.68**	565.00	**13.00**
C	20.00	Yes	**3.22**	565.00	**13.00**

Level: 1st Flr Below Flat Rf

Line ID	WIND	w (plf) = 90 plf EZ_{wind} = 367 lbs		SEISMIC w_{EQ} = 5.5 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
E	1.00	Yes	**0.46**	1246.00	**6.85**

REACTION SUMMARY - 2nd FLOOR		
Line ID	**Σ W (k)**	**Σ EQ (k)**
A	0.94	10.00
C	0.94	10.00

REACTION SUMMARY - 1st FLOOR		
Line ID	**Σ W (k)**	**Σ EQ (k)**
A	2.62	23.00
C	4.16	23.00
E	0.46	6.85

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 2nd Flr (R=3.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **2nd Flr (R=3.5)**

EQ Modifiers	2nd Flr (R=3.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **10001#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 7.7

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 40.51 ft	l_{sw} = 30.84 ft
v_{dia} = **141 plf**	v_{sw} = **324 plf**
$F_{coll-max}$ = **1832#**	Δ_{sw} = 0.26 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**
Shear Wall: **Other Grades 15/32 w/8d, EN@4"oc, (380plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	7.17	OK	555	--- ---	3.29	1.74	--- ---	-35 -174	18.60	--- ---	2493 2353			
Open		9.67	---	-1832	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.67	OK	0	--- ---	35.86	5.75	--- ---	-820 -681	61.40	--- ---	1582 1722			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 2nd Flr (R=3.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **2nd Flr (R=3.5)**

EQ Modifiers	2nd Flr (R=3.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **10001#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated — SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 6.0

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 24.17 ft
v_{dia} = **141 plf**	v_{sw} = **414 plf**
$F_{coll-max}$ = **2586#**	Δ_{sw} = 0.26 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**
Shear Wall: **Other Grades 15/32 w/10d, EN@4"oc, (460plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing (in SDC D, E or F)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	8.67	OK	1446	--- ---	4.81	2.69	--- ---	-25 -260	28.70	--- ---	3159 2924			
Open		16.33	---	-2586	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	15.50	OK	0	--- ---	15.38	4.80	--- ---	-530 -295	51.31	--- ---	2570 2805			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 1st Flr (R=3.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **1st Flr (R=3.5)**

EQ Modifiers	1st Flr (R=3.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2618#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **22996#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**

(●) Segmented ( ) Perforated
C_0 = 1.00
bays = 5.8

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 34.50 ft
v_{dia} = **551 plf**	v_{sw} = **667 plf**
$F_{coll-max}$ = **2353#**	Δ_{sw} = 0.54 in

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@2", EN@3" (600plf)**
Shear Wall: **Other Grades 7/16 w/8d, EN@2"oc, (640plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.67	OK	1054	--- ---	22.31	9.72	--- ---	-361 -707	85.34	--- ---	7075 6730			
Open		6.00	---	-2353	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.83	OK	0	--- ---	111.30	21.70	--- ---	-2278 -1932	190.60	--- ---	4962 5307			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 1st Flr (R=3.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **1st Flr (R=3.5)**

EQ Modifiers	1st Flr (R=3.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **4158#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **22996#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 3.6

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 39.49 ft	l_{sw} = 21.66 ft
v_{dia} = **565 plf**	v_{sw} = **1062 plf**
$F_{coll\text{-}max}$ = **5311#**	Δ_{sw} = #N/A

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@2", EN@3" (600plf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	11.08	OK	5311	--- ---	24.06	25.52	--- ---	1048 21	141.16	--- ---	11977 10950			
Open		17.83	---	-5071	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.58	OK	0	--- ---	21.94	24.37	--- ---	85 1112	134.79	--- ---	11039 12066			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---		---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=3.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line E @ 1st Flr (R=3.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **E** @ **1st Flr (R=3.5)**

EQ Modifiers	1st Flr (R=3.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **457#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.80**	V_{EQ} = **12709#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **8.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 2.9

Diaphragm:	Shearwall:
l_{dia} = 33.33 ft	l_{sw} = 17.17 ft
v_{dia} = **305 plf**	v_{sw} = **740 plf**
$F_{coll-max}$ = **2860#**	Δ_{sw} = #N/A

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 3.5:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.17	---	-1209	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		4.33	---	-2860	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	9.00	OK	370	--- / ---	8.75	2.87	--- / ---	-404 / -404	79.94	--- / ---	8663 / 8663			
Open		4.33	---	-1281	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.17	OK	216	--- / ---	1.88	1.33	--- / ---	-69 / -69	37.04	--- / ---	9661 / 9661			
Open		4.33	---	-1436	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.00	OK	0	--- / ---	1.73	1.28	--- / ---	-56 / 69	35.53	--- / ---	9730 / 9855			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- / ---	---	---	--- / ---	--- / ---	---	--- / ---	--- / ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Wood Shear Walls
Admin & South Wing
(R = 6.5)

Covenant Engineering

Date: 6/10/2016
Engineer: TMM
Project #: P22081
Project Name: GAA - Ft. Bragg Fire (E) Admin (R=6.5)

Lateral Shearwall Design Summary

Level	Line	Method	v_{SW} (plf)	SW	v_{Dia} (plf)	F_{HD} (lbs)	HD	F_{strap} (lbs)	Strap	Orient
2nd Flr	2	SEGMENT	192	n/a	109	-1304	n/a	n/a	n/a	n/a
"	4	SEGMENT	192	n/a	109	-1304	n/a	n/a	n/a	n/a
"	A	SEGMENT	174	n/a	76	1201	n/a	n/a	n/a	n/a
"	C	SEGMENT	222	n/a	76	1532	n/a	n/a	n/a	n/a
1st Flr	1	SEGMENT	497	n/a	331	6599	n/a	n/a	n/a	n/a
"	2	SEGMENT	744	n/a	569	2457	n/a	n/a	n/a	n/a
"	3	SEGMENT	442	n/a	111	5334	n/a	n/a	n/a	n/a
"	4	SEGMENT	320	n/a	207	2583	n/a	n/a	n/a	n/a
"	A	SEGMENT	359	n/a	296	3199	n/a	n/a	n/a	n/a
"	C	SEGMENT	571	n/a	304	5889	n/a	n/a	n/a	n/a
"	E	SEGMENT	399	n/a	164	5178	n/a	n/a	n/a	n/a

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Lateral Load Line Reactions

Level: 2nd Flr Walls Perp To Eaves

Line ID	WIND	w (plf) = 95 plf EZ_{wind} = 329 lbs		SEISMIC w_{EQ} = 9.5 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	20.25	Yes	**2.25**	565.00	**5.37**
4	20.25	Yes	**2.25**	565.00	**5.37**

Level: 2nd Flr Walls Perp To Gables

Line ID	WIND	w (plf) = 55 plf EZ_{wind} = 166 lbs		SEISMIC w_{EQ} = 9.5 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
A	14.00	Yes	**0.94**	565.00	**5.37**
C	14.00	Yes	**0.94**	565.00	**5.37**

Level: 1st Flr Below 2nd Flr

Line ID	WIND	w (plf) = 140 plf EZ_{wind} = 422 lbs		SEISMIC w_{EQ} = 12.4 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	20.25	Yes	**3.26**	565.00	**7.01**
4	20.25	No	**2.84**	565.00	**7.01**
A	9.00	Yes	**1.68**	565.00	**7.01**
C	20.00	Yes	**3.22**	565.00	**7.01**

Level: 1st Flr Below Flat Rf

Line ID	WIND	w (plf) = 90 plf EZ_{wind} = 367 lbs		SEISMIC w_{EQ} = 5.5 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
2	19.50	Yes	**2.12**	871.00	**4.79**
3	6.00	Yes	**0.91**	375.00	**2.06**
4	6.00	Yes	**0.91**	1246.00	**6.85**
E	1.00	Yes	**0.46**	1246.00	**6.85**

Level: South Wing

Line ID	WIND	w (plf) = 92 plf EZ_{wind} = 469 lbs		SEISMIC w_{EQ} = 12.6 psf	
	L_{trib} (ft)	EZ	**R_w (k)**	A_{trib} (sf)	**R_{EQ} (k)**
1	25.00	Yes	**2.77**	1895.00	**23.88**
2	25.00	No	**2.30**	1895.00	**23.88**

REACTION SUMMARY - 2nd FLOOR

Line ID	**Σ W (k)**	**Σ EQ (k)**
2	2.25	5.37
4	2.25	5.37
A	0.94	5.37
C	0.94	5.37

REACTION SUMMARY - 1st FLOOR

Line ID	**Σ W (k)**	**Σ EQ (k)**
1	2.77	23.88
2	9.93	41.04
3	0.91	2.06
4	5.99	19.23
A	2.62	12.37
C	4.16	12.37
E	0.46	6.85

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 2 @ 2nd Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **2** @ **2nd Flr (R=6.5)**

EQ Modifiers	2nd Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2253#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **5368#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **21.3 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
\# bays = 7.0

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 28.00 ft	l_{sw} = 28.00 ft
v_{dia} = **109 plf**	v_{sw} = **192 plf**
$F_{coll-max}$ = **0#**	Δ_{sw} = 0.13 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**

Shear Wall: **Other Grades 15/32 w/8d, EN@6"oc, (260plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	28.00	OK	0	--- ---	131.32	18.02	--- ---	-2210 -2210	42.94	--- ---	-1304 -1304			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

ASD Diaphragm/ASD Shearwall Design for Grid Line 4 @ 2nd Flr (R=6.5)

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 4 @ 2nd Flr (R=6.5)

EQ Modifiers	2nd Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2253#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **5368#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **21.3 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 7.0

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 28.00 ft	l_{sw} = 28.00 ft
v_{dia} = **109 plf**	v_{sw} = **192 plf**
$F_{coll-max}$ = **0#**	Δ_{sw} = 0.13 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**

Shear Wall: **Other Grades 15/32 w/8d, EN@6"oc, (260plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	28.00	OK	0	--- ---	131.32	18.02	--- ---	-2210 -2210	42.94	--- ---	-1304 -1304			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 2nd Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **2nd Flr (R=6.5)**

EQ Modifiers	2nd Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **5368#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 7.7

Diaphragm:	Shearwall:
l_{dia} = 40.51 ft	l_{sw} = 30.84 ft
v_{dia} = **76 plf**	v_{sw} = **174 plf**
$F_{coll-max}$ = **983#**	Δ_{sw} = 0.22 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**
Shear Wall: **Other Grades 15/32 w/8d, EN@6"oc, (260plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	7.17	OK	298	--- ---	3.29	1.74	--- ---	-35 -174	9.98	--- ---	1201 1062			
Open		9.67	---	-983	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.67	OK	0	--- ---	35.86	5.75	--- ---	-820 -681	32.96	--- ---	355 494			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 2nd Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **2nd Flr (R=6.5)**

EQ Modifiers	2nd Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **936#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.57**	V_{EQ} = **5368#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **8.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 6.0

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 24.17 ft
v_{dia} = **76 plf**	v_{sw} = **222 plf**
$F_{coll-max}$ = **1388#**	Δ_{sw} = 0.21 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**

Shear Wall: **Other Grades 15/32 w/10d, EN@6"oc, (310plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	8.67	OK	776	--- ---	4.81	2.69	--- ---	-25 -260	15.40	--- ---	1532 1297			
Open		16.33	---	-1388	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	15.50	OK	0	--- ---	15.38	4.80	--- ---	-530 -295	27.54	--- ---	986 1221			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Covenant Engineering

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 1 @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **1** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above				Diaphragm:	Shearwall:
ρ = **1.00**	V_{wind} = **2769#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**	◉ Segmented	SW ☐ LRFD?	l_{dia} = 70.00 ft	l_{sw} = 48.00 ft
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **23877#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**	○ Perforated	Diaph ☐ LRFD?	v_{dia} = **331 plf**	v_{sw} = **497 plf**
RM_{Factor} = **0.6D**	H_{plate} = **16.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**	C_0 = 1.00		$F_{coll-max}$ = **3752#**	Δ_{sw} = 0.48 in
					# bays = 6.0			

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**

Shear Wall: **Other Grades 15/32 w/10d, EN@3"oc, (600plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing (in SDC D, E or F)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	24.00	OK	3752	--- ---	59.90	22.15	--- ---	-587 -904	191.02	--- ---	6599 6282			
Open		22.00	---	-3752	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	24.00	OK	0	--- ---	59.90	22.15	--- ---	-904 -587	191.02	--- ---	6282 6599			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 2 @ 1st Flr (R=6.5)

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **9932#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **41041#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **16.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **21.3 ft**

◉ Segmented ○ Perforated SW ☐ LRFD? Diaph ☐ LRFD?

C_0 = 1.00
bays = 6.9

Diaphragm:	Shearwall:
l_{dia} = 70.00 ft	l_{sw} = 55.17 ft
v_{dia} = **569 plf**	v_{sw} = **744 plf**
$F_{coll-max}$ = **5570#**	Δ_{sw} = #N/A

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@2", EN@3" (600plf)**
Shear Wall: ########

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		5.33	---	-3125	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	55.17	OK	5570	--- ---	826.37	158.91	--- ---	-6647 -6708	656.66	--- ---	2457 2396			
Open		6.00	---	2052	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.50	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 3 @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **3** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **907#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **2063#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 0.8

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 17.99 ft	l_{sw} = 4.67 ft
v_{dia} = **111 plf**	v_{sw} = **442 plf**
$F_{coll-max}$ = **878#**	Δ_{sw} = 0.66 in

Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**
Shear Wall: **Other Grades 7/16 w/8d, EN@2"oc, (640plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing**

	ID/	Length	SW_{Ratio}	F_{Coll}	$H_{open(ft)}$	Unfct'd	Wind			EQ			Minimum Holdown Type		
	SW?	(ft)	3.5:1	(#)	$P_{DL-Add'l(\#)}$	$RM_{(k-ft)}$	$OTM_{(k-ft)}$	$P_{up-Add'l(\#)}$	$*F_{HD(\#)}$	$OTM_{(k-ft)}$	$P_{up-Add'l(\#)}$	$*F_{HD(\#)}$	Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	1.33	---	-152	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		4.33	---	-649	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.67	OK	878	--- ---	2.88	10.88	--- ---	2009 2009	24.75	--- ---	5334 5334			
Open		4.33	---	382	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.33	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line 4 @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **4** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **5995#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **19227#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **4.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **21.3 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 10.0

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 90.00 ft	l_{sw} = 60.09 ft
v_{dia} = **207 plf**	v_{sw} = **320 plf**
$F_{coll-max}$ = **3120#**	Δ_{sw} = 0.43 in

Diaphragm: **Unblocked (Case 1), C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (240plf)**
Shear Wall: **Other Grades 7/16 w/8d, EN@4"oc, (380plf)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL-Add'l(\#)}$	Unfct'd $RM_{(k-ft)}$	Wind $OTM_{(k-ft)}$	Wind $P_{up-Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k-ft)}$	EQ $P_{up-Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	13.67	OK	1454	--- ---	47.00	16.37	--- ---	-899 -1217	52.49	--- ---	1844 1526			
Open		3.50	---	706	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	7.50	OK	1503	--- ---	14.15	8.98	--- ---	-248 -278	28.80	--- ---	2583 2553			
Open		3.83	---	685	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	21.42	OK	2963	--- ---	115.39	25.64	--- ---	-2432 -2386	82.24	--- ---	274 319			
Open		3.33	---	2251	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	8.17	OK	3120	--- ---	16.79	9.78	--- ---	-341 -583	31.37	--- ---	2474 2231			
Open		6.00	---	1838	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	9.33	OK	2831	--- ---	21.89	11.17	--- ---	-768 -927	35.82	--- ---	2024 1865			
Open		7.75	---	1175	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	5.50	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line A @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **A** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **2618#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **12374#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate-eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
bays = 5.8

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 40.50 ft	l_{sw} = 34.50 ft
v_{dia} = **296 plf**	v_{sw} = **359 plf**
$F_{coll-max}$ = **1266#**	Δ_{sw} = 0.38 in

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**

Shear Wall: **Other Grades 7/16 w/8d, EN@4"oc, (380plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing (in SDC D, E or F)**

	ID/	Length	SW_{Ratio}	F_{Coll}	$H_{open(ft)}$	Unfct'd	Wind			EQ			Minimum Holdown Type		
	SW?	(ft)	2.0:1	(#)	$P_{DL-Add'l(\#)}$	$RM_{(k-ft)}$	$OTM_{(k-ft)}$	$P_{up-Add'l(\#)}$	$*F_{HD(\#)}$	$OTM_{(k-ft)}$	$P_{up-Add'l(\#)}$	$*F_{HD(\#)}$	Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.67	OK	567	--- ---	22.31	9.72	--- ---	-361 -707	45.92	--- ---	3199 2853			
Open		6.00	---	-1266	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	23.83	OK	0	--- ---	111.30	21.70	--- ---	-2278 -1932	102.56	--- ---	1188 1534			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line C @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **C** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **4158#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **8.0 ft**
$^{diaph}/_{base}$ = **0.97**	V_{EQ} = **12374#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **12.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **12.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **4.0 ft**

◉ Segmented ○ Perforated SW ☐ LRFD? Diaph ☐ LRFD?
C_0 = 1.00
bays = 3.6

Diaphragm:	Shearwall:
l_{dia} = 39.49 ft	l_{sw} = 21.66 ft
v_{dia} = **304 plf**	v_{sw} = **571 plf**
$F_{coll\text{-}max}$ = **2858#**	Δ_{sw} = 0.47 in

Diaphragm: **Blocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@4", EN@6" (360plf)**
Shear Wall: **Other Grades 15/32 w/10d, EN@3"oc, (600plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing (in SDC D, E or F)**

	ID/ SW?	Length (ft)	SW_{Ratio} 2.0:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	11.08	OK	2858	--- ---	24.06	25.52	--- ---	1048 21	75.95	--- ---	5815 4787			
Open		17.83	---	-2729	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	10.58	OK	0	--- ---	21.94	24.37	--- ---	85 1112	72.53	--- ---	4862 5889			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Date: **6/10/2016**
Engineer: **TMM**
Project #: **P22081**
Project Name: **GAA - Ft. Bragg Fire (E) Admin (R=6.5)**

ASD Diaphragm/ASD Shearwall Design for Grid Line E @ 1st Flr (R=6.5)

ASD Diaphragm/ASD Shearwall Design for Grid Line **E** @ **1st Flr (R=6.5)**

EQ Modifiers	1st Flr (R=6.5)		Level(s) Above	
ρ = **1.00**	V_{wind} = **457#**	DL_{wall} = **10.0 psf**	V_{wind} = **0#**	H_{wall} = **0.0 ft**
$^{diaph}/_{base}$ = **0.80**	V_{EQ} = **6853#**	DL_{story} = **12.0 psf**	V_{EQ} = **0#**	DL_{story} = **0.0 psf**
RM_{Factor} = **0.6D**	H_{plate} = **12.0 ft**	$Trib_{story}$ = **8.0 ft**	$H_{plate\text{-}eff}$ = **0.0 ft**	$Trib_{story}$ = **0.0 ft**

◉ Segmented ○ Perforated
C_0 = 1.00
\# bays = 2.9

SW ☐ LRFD?
Diaph ☐ LRFD?

Diaphragm:	Shearwall:
l_{dia} = 33.33 ft	l_{sw} = 17.17 ft
v_{dia} = **164 plf**	v_{sw} = **399 plf**
$F_{coll\text{-}max}$ = **1542#**	Δ_{sw} = 0.74 in

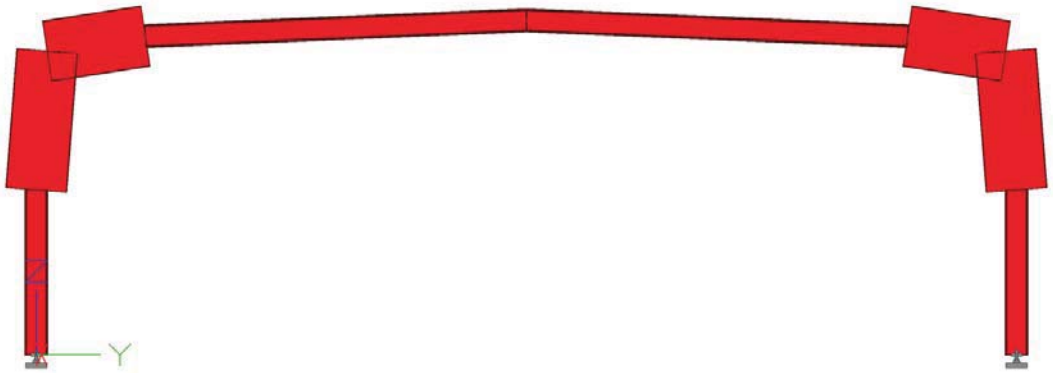
Diaphragm: **Unblocked, C-C, C-D 15/32 w/8d o/2x Nom. Framing, BN@6", EN@6" (180plf)**

Shear Wall: **Struct-I 15/32 w/10d, EN@3"oc, (665plf), w/Staggered Nailing @ Panel Edges o/3" Nom Framing (in SDC D, E or F)**

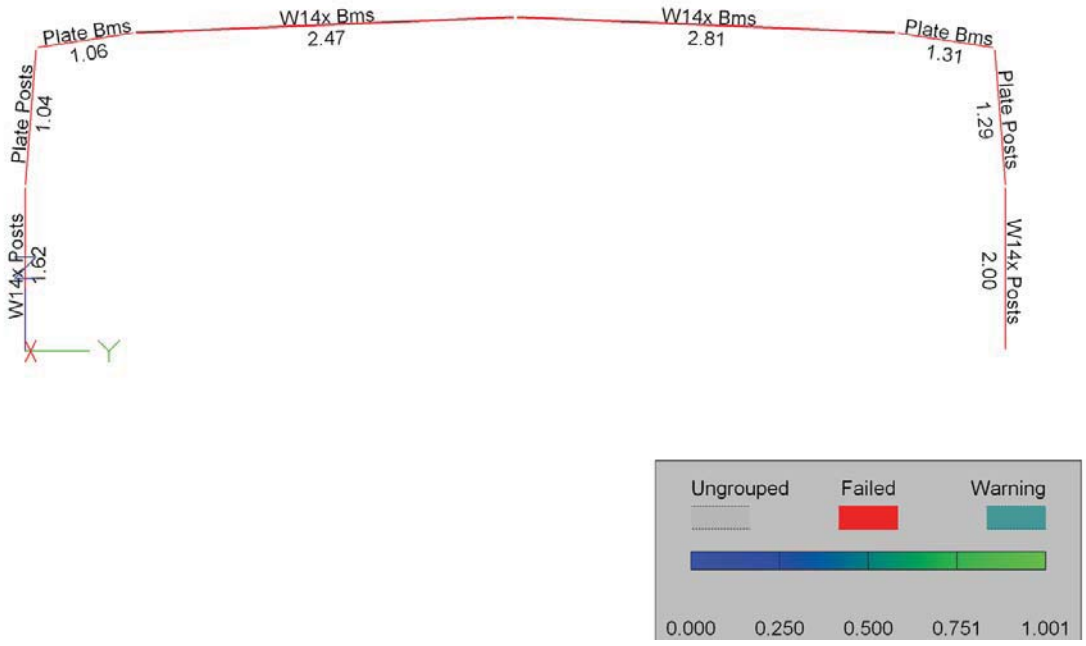
	ID/ SW?	Length (ft)	SW_{Ratio} 3.5:1	F_{Coll} (#)	$H_{open(ft)}$ / $P_{DL\text{-}Add'l(\#)}$	Unfct'd $RM_{(k\text{-}ft)}$	Wind $OTM_{(k\text{-}ft)}$	Wind $P_{up\text{-}Add'l(\#)}$	Wind $*F_{HD(\#)}$	EQ $OTM_{(k\text{-}ft)}$	EQ $P_{up\text{-}Add'l(\#)}$	EQ $*F_{HD(\#)}$	Minimum Holdown Type: Anchor-Bolt	Foundation Strap	Floor Strap
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	3.17	---	-652	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		4.33	---	-1542	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	9.00	OK	200	--- ---	8.75	2.87	--- ---	-404 -404	43.11	--- ---	4329 4329			
Open		4.33	---	-691	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.17	OK	116	--- ---	1.88	1.33	--- ---	-69 -69	19.97	--- ---	5010 5010			
Open		4.33	---	-774	---	---	---	---	---	---	---	---	---	---	---
Shear Wall	--- ☑	4.00	OK	0	--- ---	1.73	1.28	--- ---	-56 69	19.16	--- ---	5053 5178			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---
Wall	--- ☐	0.00	---	0	--- ---	---	---	--- ---	--- ---	---	--- ---	--- ---			
Open		0.00	---	0	---	---	---	---	---	---	---	---	---	---	---

Steel OMF
South Wing
(R = 2.0)

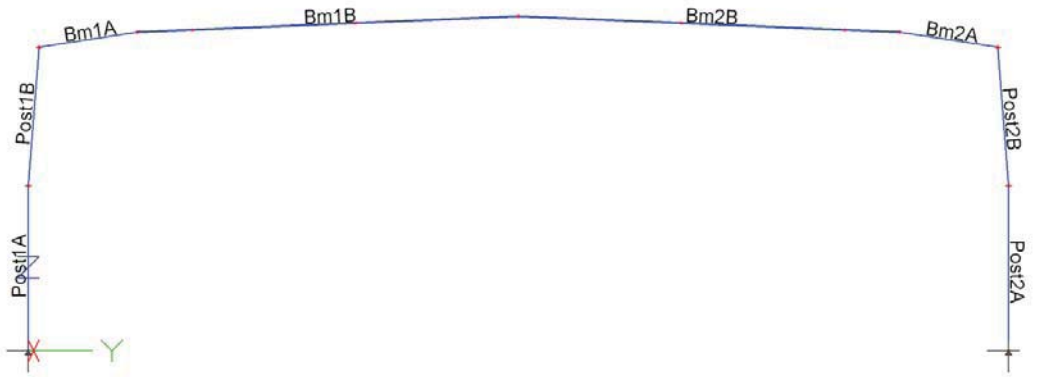
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:51 PM
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 06:04 PM
Design View, Unity Checks
IES VisualAnalysis 12.00.0016

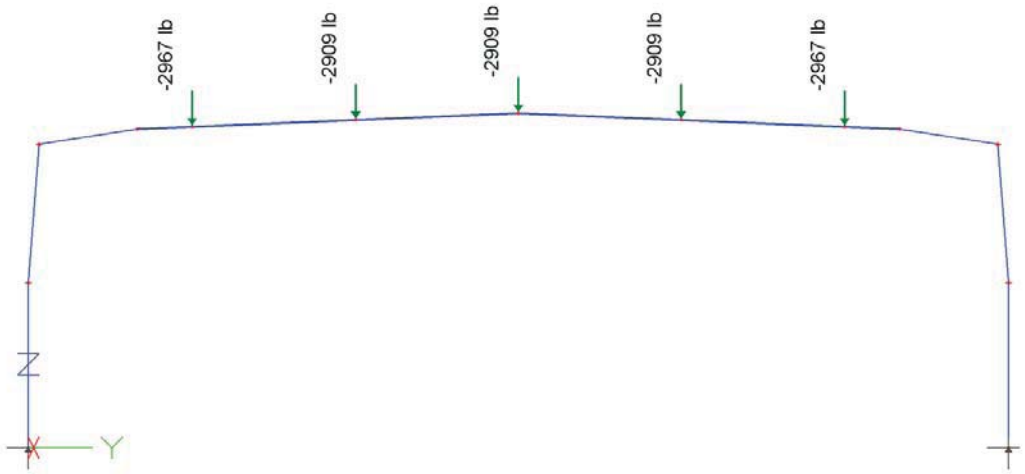


(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:50 PM
IES VisualAnalysis 12.00.0016

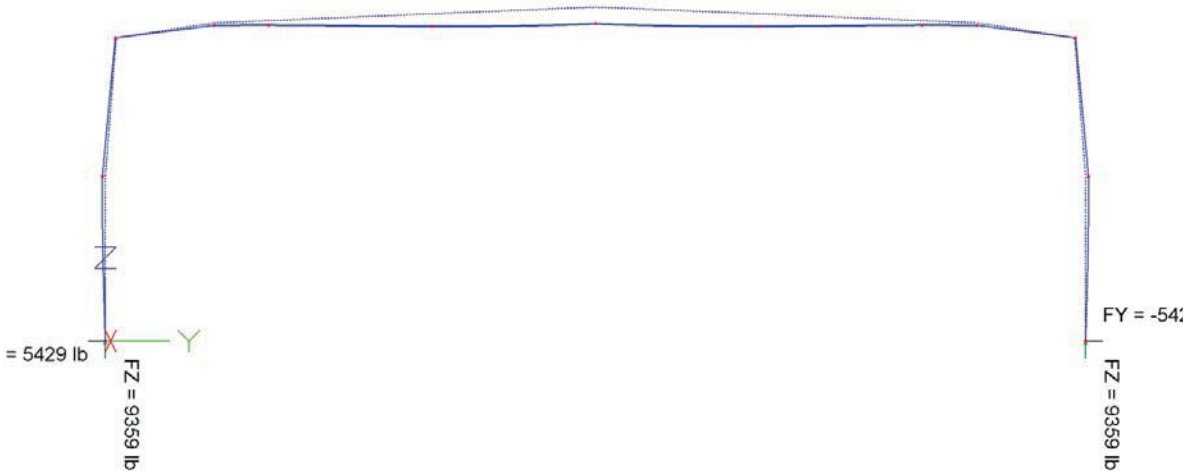


(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:49 PM
IES VisualAnalysis 12.00.0016

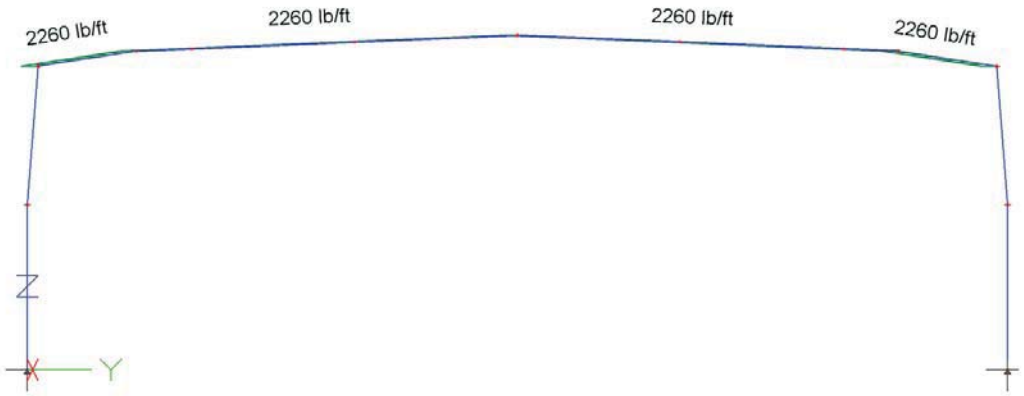
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:42 PM
Load Case: D
IES VisualAnalysis 12.00.0016



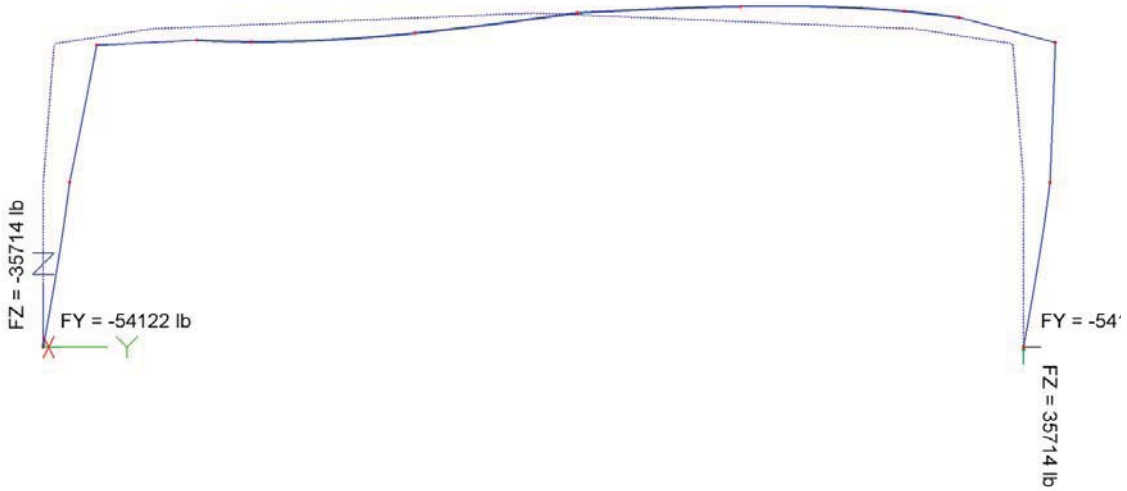
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:43 PM
Result Case: D
IES VisualAnalysis 12.00.0016



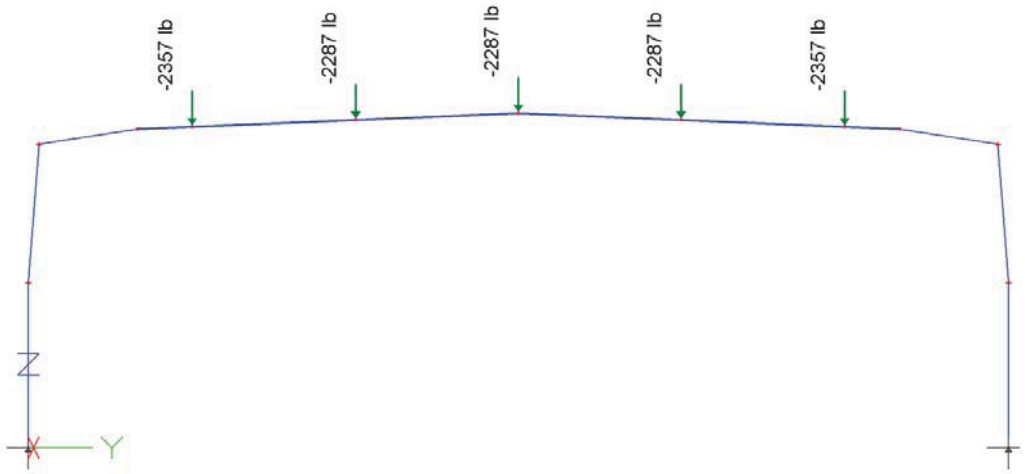
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:42 PM
Load Case: E+Y
IES VisualAnalysis 12.00.0016



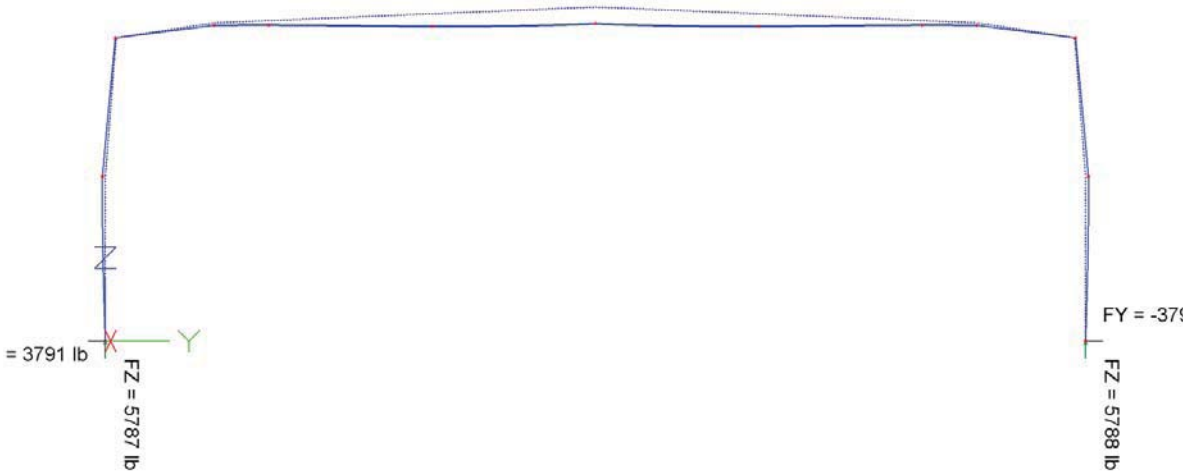
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:43 PM
Result Case: E+Y
IES VisualAnalysis 12.00.0016



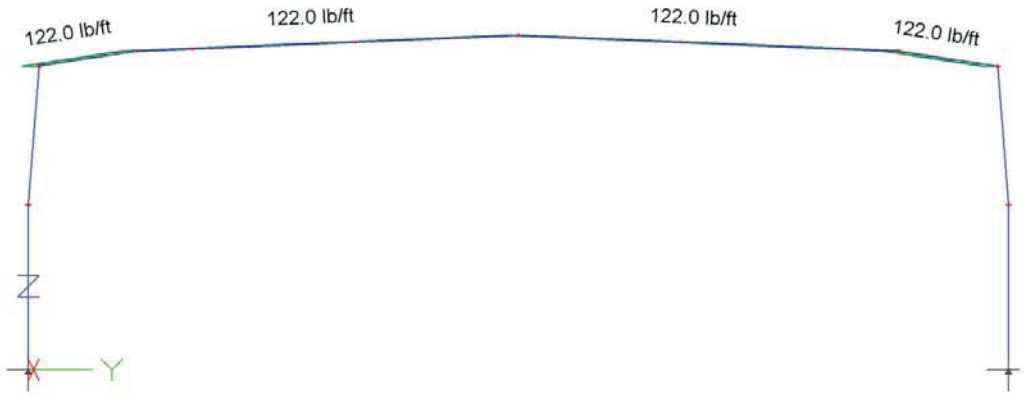
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:42 PM
Load Case: Lr
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:43 PM
Result Case: Lr
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:42 PM
Load Case: W+Y
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
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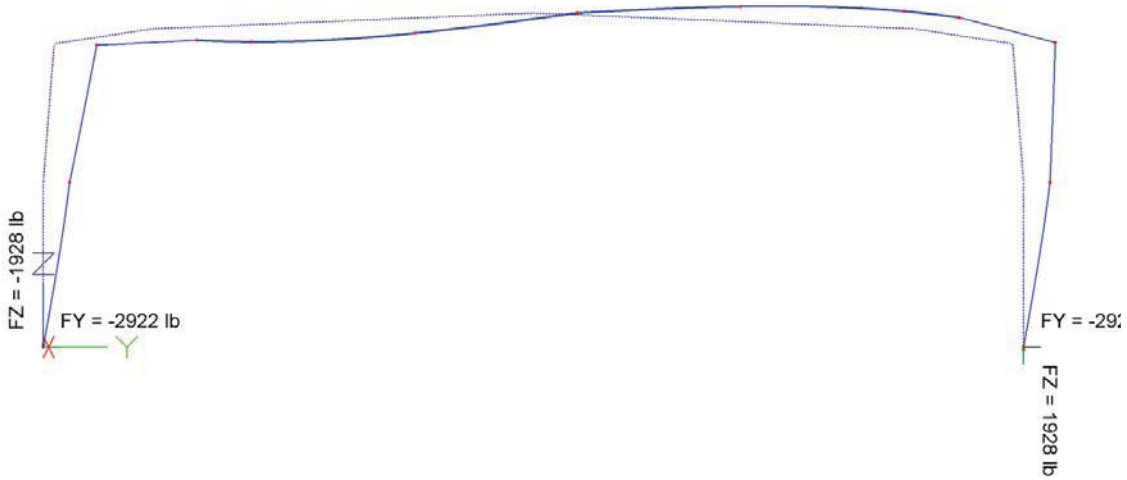
Mar 22, 2023, 05:43 PM
Result Case: W+Y
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
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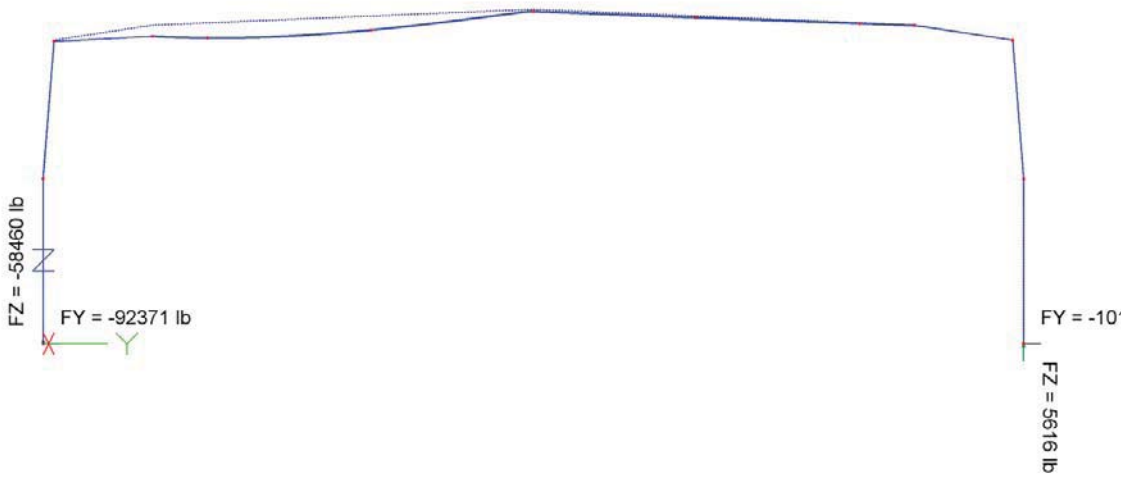
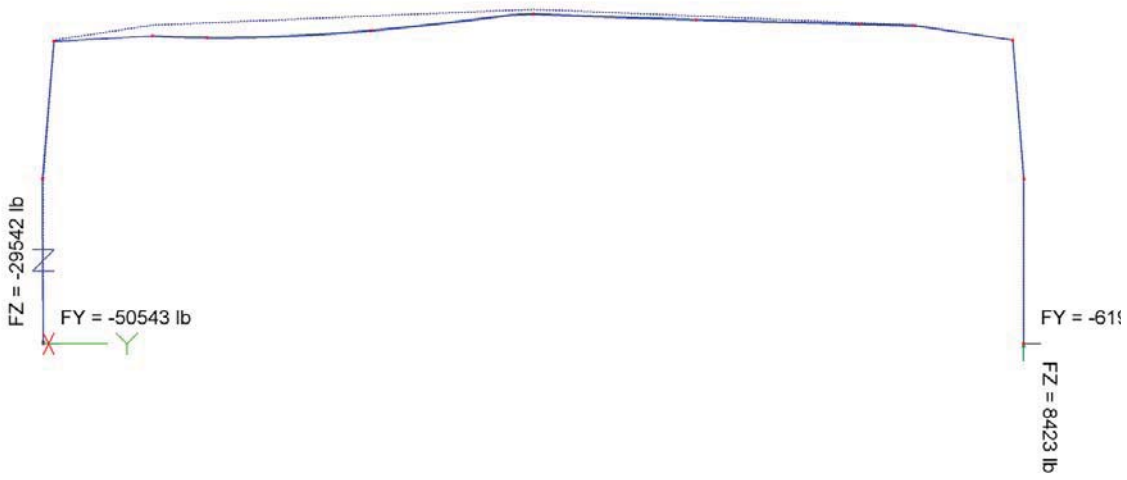
Mar 22, 2023, 05:43 PM
Result Case: ASD Envelope Low Extreme
IES VisualAnalysis 12.00.0016

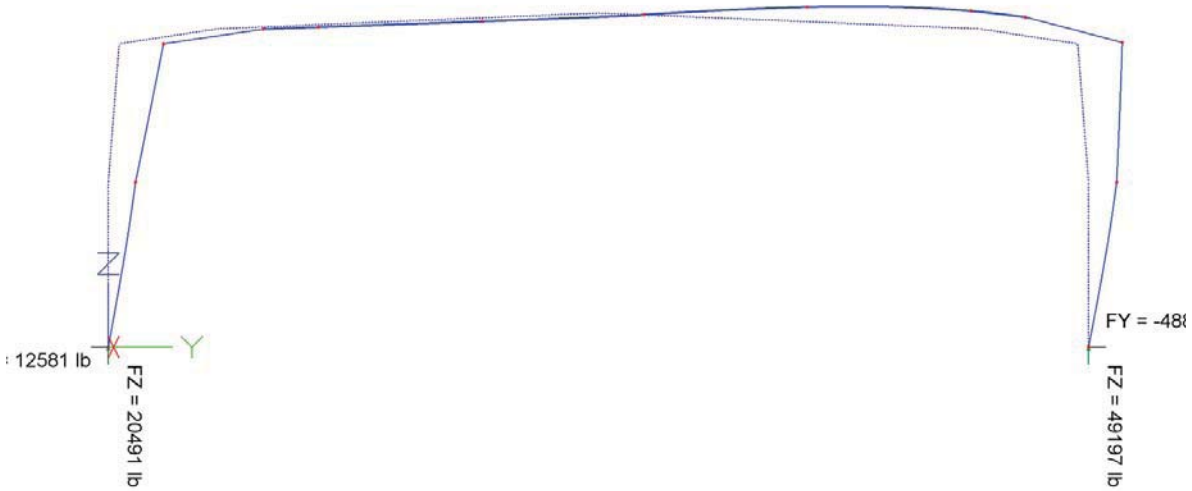


(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:43 PM
Result Case: ASD Envelope High Extreme
IES VisualAnalysis 12.00.0016

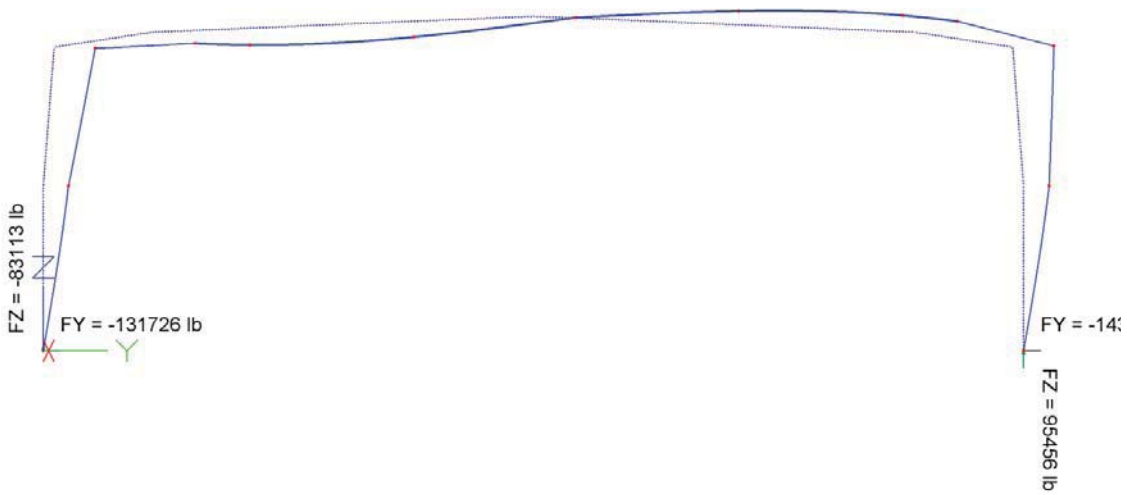
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:44 PM
Result Case: LRFD Envelope Low Extreme
IES VisualAnalysis 12.00.0016



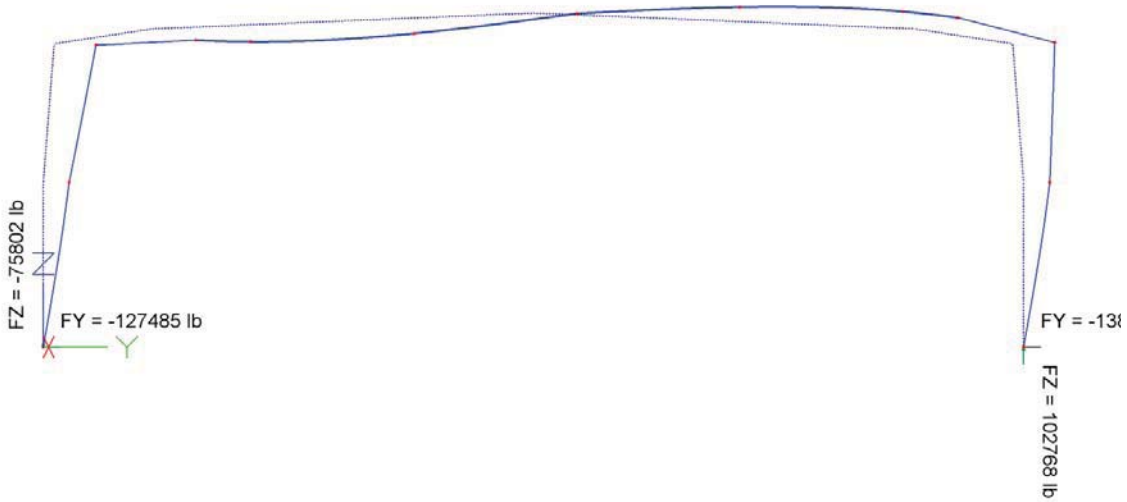
(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:44 PM
Result Case: LRFD Envelope High Extreme
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:45 PM
Result Case: LRFD Overstrength Envelope Low Extreme
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=2.0)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:46 PM
Result Case: LRFD Overstrength Envelope High Extreme
IES VisualAnalysis 12.00.0016



Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis

Table of Contents

Analysis Settings

Static Analysis Method: First Order
Automatic Meshing Total Element Count: 300
No Mode Shapes Are Calculated

Model Summary

Structure Type: Space Frame
13 Nodes, and 88 Degrees of Freedom
8 Member Elements
The model is linear.
The model will have 64 unique mode shapes.
The size of the model is:
0 ft, in the X direction
48.83 ft, in the Y direction
16.67 ft, in the Z direction

Equation Load Combinations

Load Case	*Cases*	*Equation*
0.75(D+L+W) »+Y	2	0.75D + 0.75W+Y
16-1	1	1.40D
16-2Di,S	1	1.20D
16-2Lr	2	1.20D + 0.50Lr
16-3Lr,L	2	1.20D + 1.60Lr
16-3Lr,W »+Y	3	1.20D + 1.60Lr + 0.50W+Y
16-3R,W »+Y	2	1.20D + 0.50W+Y
16-4Lr »+Y	3	1.20D + 0.50Lr + W+Y
16-4R »+Y	2	1.20D + W+Y
16-5 »+Y+30%+X	2	1.44D + E+Y
16-5 »+Y+30%+X:OS	2	1.44D + 2.50E+Y
16-6 »+Y	2	0.90D + W+Y
16-6Di	1	0.90D
16-7 »+Y+30%+X	2	0.66D + E+Y
16-7 »+Y+30%+X:OS	2	0.66D + 2.50E+Y
16-10Lr	2	D + Lr
16-10R	1	D
16-11Lr	2	D + 0.75Lr

16-12E »+Y+30%+X	2	1.17D + 0.70E+Y
16-12E »+Y+30%+X:OS	2	1.17D + 1.75E+Y
16-12W »+Y	2	D + 0.60W+Y
16-13Lr »+Y	3	D + 0.75Lr + 0.45W+Y
16-13R »+Y	2	D + 0.45W+Y
16-14 »+Y+30%+X	2	1.13D + 0.53E+Y
16-14 »+Y+30%+X:OS	2	1.13D + 1.31E+Y
16-15 »+Y	2	0.60D + 0.60W+Y
16-15Di	1	0.60D
16-16 »+Y+30%+X	2	0.43D + 0.70E+Y
16-16 »+Y+30%+X:OS	2	0.43D + 1.75E+Y
D+L	1	D
D+Lr+R	2	D + Lr
Live	1	+ Lr
Seismic »+Y	1	E+Y
Wind »+Y	1	W+Y

Statics Check

Result Case Name	Status	Error FX	Error FY	Error FZ
		lb	*lb*	*lb*
0.75(D+L+W) »+Y	OK	0.000	-0.000	-0.000
16-1	OK	0.000	-0.000	0.000
16-10Lr	OK	0.000	-0.000	0.000
16-10R	OK	0.000	-0.000	0.000
16-11Lr	OK	0.000	-0.000	0.000
16-12E »+Y+30%+X	1.6% RX	0.000	-0.000	-0.000
16-12E »+Y+30%+X:OS	1.6% RX	0.000	-0.000	-0.000
16-12W »+Y	OK	0.000	-0.000	-0.000
16-13Lr »+Y	OK	0.000	-0.000	0.000
16-13R »+Y	OK	0.000	-0.000	-0.000
16-14 »+Y+30%+X	1.5% RX	0.000	-0.000	-0.000
16-14 »+Y+30%+X:OS	1.6% RX	0.000	-0.000	-0.000
16-15 »+Y	OK	0.000	-0.000	-0.000
16-15Di	OK	0.000	-0.000	0.000
16-16 »+Y+30%+X	OK	0.000	-0.000	-0.000
16-16 »+Y+30%+X:OS	OK	0.000	-0.000	-0.000
16-2Di,S	OK	0.000	-0.000	0.000
16-2Lr	OK	0.000	-0.000	0.000
16-3Lr,L	OK	0.000	-0.000	0.000
16-3Lr,W »+Y	OK	0.000	-0.000	-0.000
16-3R,W »+Y	OK	0.000	-0.000	-0.000
16-4Lr »+Y	OK	0.000	-0.000	-0.000
16-4R »+Y	OK	0.000	-0.000	-0.000
16-5 »+Y+30%+X	2.0% RX	0.000	-0.000	-0.000
16-5 »+Y+30%+X:OS	2.0% RX	0.000	-0.000	-0.000
16-6 »+Y	OK	0.000	-0.000	-0.000
16-6Di	OK	0.000	-0.000	-0.000
16-7 »+Y+30%+X	OK	0.000	-0.000	-0.000
16-7 »+Y+30%+X:OS	OK	0.000	-0.000	-0.000
ASD Envelope High Extreme	OK	0.000	0.000	0.000
ASD Envelope Low Extreme	OK	0.000	0.000	0.000
All Load Cases Envelope High Extreme	OK	0.000	0.000	0.000
All Load Cases Envelope Low Extreme	OK	0.000	0.000	0.000
D	OK	0.000	-0.000	0.000

D+L	OK	0.000	-0.000	0.000
D+Lr+R	OK	0.000	-0.000	0.000
E+Y	OK	0.000	-0.000	-0.000
LRFD Envelope High Extreme	OK	0.000	0.000	0.000
LRFD Envelope Low Extreme	OK	0.000	0.000	0.000
LRFD Overstrength Envelope High Extreme	OK	0.000	0.000	0.000
LRFD Overstrength Envelope Low Extreme	OK	0.000	0.000	0.000
Live	OK	0.000	-0.000	0.000
Lr	OK	0.000	-0.000	0.000
Seismic »+Y	OK	0.000	-0.000	-0.000
Serviceabilty Envelope High Extreme	OK	0.000	0.000	0.000
Serviceabilty Envelope Low Extreme	OK	0.000	0.000	0.000
W+Y	OK	0.000	-0.000	-0.000
Wind »+Y	OK	0.000	-0.000	-0.000

Nodes

Node	X	Y	Z	Fix DX	Fix DY	Fix DZ	Fix RX	Fix RY	Fix RZ
	ft	*ft*	*ft*						
B1	0.000	0.000	0.000	Yes	Yes	Yes	No	Yes	Yes
B2	0.000	48.833	0.000	Yes	Yes	Yes	No	Yes	Yes
F01	0.000	0.000	8.208	Yes	No	No	No	No	No
F02	0.000	0.542	15.129	Yes	No	No	No	No	No
F03	0.000	5.436	15.875	No	No	No	No	No	No
F04	0.000	8.165	15.989	No	No	No	No	No	No
F05	0.000	16.312	16.328	No	No	No	No	No	No
F06	0.000	24.417	16.666	No	No	No	No	No	No
F07	0.000	32.521	16.328	No	No	No	No	No	No
F08	0.000	40.668	15.989	No	No	No	No	No	No
F09	0.000	43.398	15.875	No	No	No	No	No	No
F10	0.000	48.292	15.129	Yes	No	No	No	No	No
F11	0.000	48.833	8.208	Yes	No	No	No	No	No

Member Elements

Member	Section	Material	(1)Node	(2)Node	Length	Rz 1	Rz 2	One Way	Framing
					ft				
Bm1A	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F03	F02	4.951	Rigid	Rigid	Normal (2-way)	Beam
Bm1B	W14x43	ASTM A992 Grade 50	F06	F03	18.997	Rigid	Rigid	Normal (2-way)	Beam
Bm2A	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F10	F09	4.951	Rigid	Rigid	Normal (2-way)	Beam
Bm2B	W14x43	ASTM A992 Grade 50	F09	F06	18.997	Rigid	Rigid	Normal (2-way)	Beam
Post1A	W14x43	ASTM A992 Grade 50	F01	B1	8.208	Rigid	Rigid	Normal (2-way)	Column
Post1B	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F02	F01	6.942	Rigid	Rigid	Normal (2-way)	Column
Post2A	W14x43	ASTM A992 Grade 50	B2	F11	8.208	Rigid	Rigid	Normal (2-way)	Column
Post2B	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F11	F10	6.942	Rigid	Rigid	Normal (2-way)	Column

Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis

Nodal Loads

Load Case	Node	Direction	Force	Moment
			lb	*lb-ft*
D	F04	DZ	-2967.000	0.000
D	F05	DZ	-2909.000	0.000
D	F06	DZ	-2909.000	0.000
D	F07	DZ	-2909.000	0.000
D	F08	DZ	-2967.000	0.000
Lr	F04	DZ	-2357.000	0.000
Lr	F05	DZ	-2287.000	0.000
Lr	F06	DZ	-2287.000	0.000
Lr	F07	DZ	-2287.000	0.000
Lr	F08	DZ	-2357.000	0.000

Member Uniform Loads

Load Case	Member	Direction	Offset	End Offset	Force	Moment
			ft	*ft*	*lb/ft*	*ft-lb/ft*
E+Y	Bm1A	Force Y	0.000	4.951	2260.000	-NA-
E+Y	Bm1B	Force Y	0.000	18.997	2260.000	-NA-
E+Y	Bm2A	Force Y	0.000	4.951	2260.000	-NA-
E+Y	Bm2B	Force Y	0.000	18.997	2260.000	-NA-
W+Y	Bm1A	Force Y	0.000	4.951	122.000	-NA-
W+Y	Bm1B	Force Y	0.000	18.997	122.000	-NA-
W+Y	Bm2A	Force Y	0.000	4.951	122.000	-NA-
W+Y	Bm2B	Force Y	0.000	18.997	122.000	-NA-

Member Stresses

Member	+fa	-fa	+fbz	-fbz	+fby	-fby	fvy	fvz
	psf	*psf*	*psf*	*psf*	*psf*	*psf*	*psf*	*psf*
Bm1A	968680.650	-104240.912	14301457.227	-14301457.227	-0.000	0.000	-456553.744	0.000
Bm1B	1224671.156	-152710.065	44867957.331	-44867957.331	-0.000	0.000	-1010264.095	0.000
Bm2A	0.000	-1063371.508	15494870.925	-15494870.925	-0.000	0.000	559596.479	0.000
Bm2B	0.000	-1362994.163	47227239.651	-47227239.651	-0.000	0.000	1104140.772	0.000
Post1A	952521.572	-234184.775	29846748.047	-29846748.047	-0.000	0.000	1505443.820	0.000
Post1B	635468.947	-142344.037	14301457.227	-14301457.227	-0.000	0.000	846534.259	0.000
Post2A	0.000	-1174488.703	32429996.019	-32429996.019	-0.000	0.000	-1635740.585	0.000
Post2B	0.000	-767147.654	15494870.925	-15494870.925	-0.000	0.000	-913993.348	0.000

Member End Reactions (Extreme Rows Only)

Member	Result Case Name	Offset	Fx	Vy	Vz	Mx	My	Mz
		ft	*lb*	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
Bm1A	16-7 »+Y+30%+X:OS	4.951	**142832.046**	-62870.147	-0.000	0.000	-0.000	-1947683.092
Bm1A	D	0.000	-6594.669	7235.076	**-0.000**	**0.000**	**-0.000**	40699.700
Bm2A	16-5 »+Y+30%+X:OS	0.000	**-156794.221**	78807.507	-0.000	0.000	-0.000	-2110211.402
Post1A	16-7 »+Y+30%+X:OS	0.000	83345.640	**131726.338**	-0.000	0.000	-0.000	-1081253.693
Post1B	16-3Lr,L	0.000	-20387.673	-11023.402	-0.000	0.000	-0.000	**179627.479**
Post2A	16-5 »+Y+30%+X:OS	0.000	-102767.765	**-143127.306**	-0.000	0.000	-0.000	0.000
Post2B	16-5 »+Y+30%+X:OS	6.942	-112394.527	-134768.399	-0.000	0.000	-0.000	**-2110211.402**

Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis

Design Groups

Group/Mesh	*Elements*	*Unity*	*Design Shape*	*Design Material*	*Overstrength*	*Specification*
Plate Bms	2	1.31	-NA-	ASTM A36	No	AISC LRFD (2010)
Plate Posts	2	1.29	-NA-	ASTM A36	No	AISC LRFD (2010)
W14x Bms	2	2.81	-NA-	ASTM A992 Grade 50	No	AISC LRFD (2010)
W14x Posts	2	2.00	-NA-	ASTM A992 Grade 50	No	AISC LRFD (2010)

Design Group Results

Design Group: W14x Bms per AISC LRFD (2010)

FAIL! Worst case unity = 2.809
Checked As: W14x43, Material: \Steel\ASTM A992 Grade 50
Members Included (2): Bm1B, Bm2B

Strong Deflection Check

Member Name	Result Case	Offset ft	Demand dy in	Capacity dy in	Code Ref.	Unity Check	Details
Bm1B	Seismic »+Y	10.948	2.153	1.266	IBC 1604.3.1	**1.70 FAIL**	
Bm2B	Seismic »+Y	8.050	2.153	1.266	IBC 1604.3.1	**1.70 FAIL**	

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	H1-1b	**2.47 FAIL**	Cb = 1.588 , Lb = 18.997 ft
Bm2B	16-5 »+Y+30%+X	0.000	H1-1b	**2.81 FAIL**	KLz = 18.997 ft, KLy = 2.732 ft, Kz = 1.000 , Ky = 1.000 , Cb = 1.795 , Lb = 18.997 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	40583.237	567000.017	D2-1	0.07 OK	
Bm2B	16-5 »+Y+30%+X	0.000	52686.500	506991.191	E3-2FB	0.10 OK	KLz = 18.997 ft, KLy = 2.732 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	-634067.492	260999.994	F2-1	**2.43 FAIL**	Lb = 18.997 ft, Cb = 1.588
Bm2B	16-5 »+Y+30%+X	0.000	-719536.861	260999.994	F2-1	**2.76 FAIL**	Lb = 18.997 ft, Cb = 1.795

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	0.000	-34873.705	125355.001	G2-1	0.28 OK	
Bm2B	16-5 »+Y+30%+X	2.748	45383.474	125355.001	G2-1	0.36 OK	

Design Group: Plate Bms per AISC LRFD (2010)

FAIL! Worst case unity = 1.308
Checked As: I-Beam 35.8 x 0.325 x 8 x 0.625, Material: \Steel\ASTM A36
Members Included (2): Bm1A, Bm2A

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Bm1A	16-7 »+Y+30%+X	4.951	H1-1b	**1.06 FAIL**	Cb = 1.064 , Lb = 4.951 ft
Bm2A	16-5 »+Y+30%+X	0.000	H1-1b	**1.31 FAIL**	KL = 4.951 ft, Cb = 1.091 , Lb = 4.951 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Bm1A	16-7 »+Y+30%+X	4.951	54502.345	687943.125	D2-1	0.08 OK	
Bm2A	16-5 »+Y+30%+X	0.000	68464.520	473236.466	E7-2FB	0.14 OK	Lu = 4.951 ft, KL = 4.951 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Bm1A	16-7 »+Y+30%+X	4.951	-748452.903	737089.255	F2-1	**1.02 FAIL**	Lb = 4.951 ft, Cb = 1.064
Bm2A	16-5 »+Y+30%+X	0.000	-910981.213	737089.255	F2-1	**1.24 FAIL**	Lb = 4.951 ft, Cb = 1.091

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Bm1A	16-7 »+Y+30%+X	0.000	-24065.070	121678.300	G2-1	0.20 OK	
Bm2A	16-5 »+Y+30%+X	4.951	39258.730	121678.300	G2-1	0.32 OK	

Design Group: W14x Posts per AISC LRFD (2010)

FAIL! Worst case unity = 1.998
Checked As: W14x43, Material: \Steel\ASTM A992 Grade 50
Members Included (2): Post1A, Post2A

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Post1A	16-7 »+Y+30%+X	0.000	H1-1b	**1.62 FAIL**	Cb = 1.667 , Lb = 8.208 ft

Post2A	16-5 »+Y+30%+X	8.208	H1-1b	**2.00 FAIL**	KLz = 8.208 ft, KLy = 7.158 ft, Kz = 1.000 , Ky = 0.872 , Cb = 1.667 , Lb = 8.208 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Post1A	16-7 »+Y+30%+X	0.000	29774.792	567000.017	D2-1	0.05 OK	
Post2A	16-5 »+Y+30%+X	0.000	49196.916	487837.911	E3-2FB	0.10 OK	KLz = 8.208 ft, KLy = 7.158 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Post1A	16-7 »+Y+30%+X	0.000	-414870.452	260999.994	F2-1	**1.59 FAIL**	Lb = 8.208 ft, Cb = 1.667
Post2A	16-5 »+Y+30%+X	8.208	-508453.391	260999.994	F2-1	**1.95 FAIL**	Lb = 8.208 ft, Cb = 1.667

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Post1A	16-7 »+Y+30%+X	8.208	50542.593	125355.001	G2-1	0.40 OK	
Post2A	16-5 »+Y+30%+X	8.208	-61943.560	125355.001	G2-1	0.49 OK	

Design Group: Plate Posts per AISC LRFD (2010)

FAIL! Worst case unity = 1.294
Checked As: I-Beam 35.8 x 0.325 x 8 x 0.625, Material: \Steel\ASTM A36
Members Included (2): Post1B, Post2B

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Post1B	16-7 »+Y+30%+X	0.000	H1-1b	**1.04 FAIL**	Cb = 1.217 , Lb = 6.942 ft
Post2B	16-5 »+Y+30%+X	6.942	H1-1b	**1.29 FAIL**	KL = 6.942 ft, Cb = 1.215 , Lb = 6.942 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Post1B	16-7 »+Y+30%+X	0.000	33957.923	687943.125	D2-1	0.05 OK	
Post2B	16-5 »+Y+30%+X	0.000	53373.959	453923.439	E7-2FB	0.12 OK	Lu = 6.942 ft, KL = 6.942 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details

Post1B	16-7 »+Y+30%+X	0.000	-748452.903	737089.255	F2-1	**1.02 FAIL**	Lb = 6.942 ft, Cb = 1.217
Post2B	16-5 »+Y+30%+X	6.942	-910981.213	737089.255	F2-1	**1.24 FAIL**	Lb = 6.942 ft, Cb = 1.215

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Post1B	16-7 »+Y+30%+X	6.942	48065.272	121678.300	G2-1	0.40 OK	
Post2B	16-5 »+Y+30%+X	6.942	-58012.120	121678.300	G2-1	0.48 OK	

Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=2.0)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - Load Case Results

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	D	**0.000**	**5429.032**	9359.307	**-NA-**	**0.000**	**0.000**
B1	E+Y	0.000	-54122.497	**-35713.899**	-NA-	0.000	0.000
B1	Lr	0.000	3791.088	5787.500	-NA-	0.000	0.000
B1	W+Y	0.000	-2921.657	-1927.918	-NA-	0.000	0.000
B2	D	0.000	-5429.032	9359.307	-NA-	0.000	0.000
B2	E+Y	0.000	**-54122.497**	**35713.899**	-NA-	0.000	0.000
B2	Lr	0.000	-3791.088	5787.500	-NA-	0.000	0.000
B2	W+Y	0.000	-2921.657	1927.918	-NA-	0.000	0.000
F01	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	E+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	E+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	E+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	E+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

(E) South Wing Steel (R=2.0)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - ASD Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-10Lr	**0.000**	**9220.120**	15146.807	**-NA-**	**0.000**	**0.000**
B1	16-10R	0.000	5429.032	9359.307	-NA-	0.000	0.000
B1	16-11Lr	0.000	8272.348	13699.932	-NA-	0.000	0.000
B1	16-12W »+Y	0.000	3676.038	8202.556	-NA-	0.000	0.000
B1	16-13Lr »+Y	0.000	6957.602	12832.369	-NA-	0.000	0.000
B1	16-13R »+Y	0.000	4114.286	8491.744	-NA-	0.000	0.000
B1	16-15 »+Y	0.000	1504.425	4458.833	-NA-	0.000	0.000
B1	16-15Di	0.000	3257.419	5615.584	-NA-	0.000	0.000
B2	16-10Lr	0.000	-9220.120	**15146.807**	-NA-	0.000	0.000
B2	16-10R	0.000	-5429.032	9359.307	-NA-	0.000	0.000
B2	16-11Lr	0.000	-8272.348	13699.932	-NA-	0.000	0.000
B2	16-12W »+Y	0.000	-7182.026	10516.058	-NA-	0.000	0.000
B2	16-13Lr »+Y	0.000	**-9587.093**	14567.495	-NA-	0.000	0.000
B2	16-13R »+Y	0.000	-6743.778	10226.870	-NA-	0.000	0.000
B2	16-15 »+Y	0.000	-5010.413	6772.335	-NA-	0.000	0.000
B2	16-15Di	0.000	-3257.419	5615.584	-NA-	0.000	0.000
F01	16-10Lr	0.000	-NA-	**-NA-**	-NA-	-NA-	-NA-
F01	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-10Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-10Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-10Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

F11	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=2.0)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - LRFD Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-1	**0.000**	7600.645	13103.030	**-NA-**	**0.000**	**0.000**
B1	16-2Di,S	0.000	6514.838	11231.168	-NA-	0.000	0.000
B1	16-2Lr	0.000	8410.382	14124.918	-NA-	0.000	0.000
B1	16-3Lr,L	0.000	**12580.579**	20491.168	-NA-	0.000	0.000
B1	16-3Lr,W »+Y	0.000	11119.750	19527.209	-NA-	0.000	0.000
B1	16-3R,W »+Y	0.000	5054.010	10267.209	-NA-	0.000	0.000
B1	16-4Lr »+Y	0.000	5488.725	12197.000	-NA-	0.000	0.000
B1	16-4R »+Y	0.000	3593.182	9303.250	-NA-	0.000	0.000
B1	16-6 »+Y	0.000	1964.472	6495.458	-NA-	0.000	0.000
B1	16-6Di	0.000	4886.129	8423.376	-NA-	0.000	0.000
B2	16-1	0.000	-7600.645	13103.030	-NA-	0.000	0.000
B2	16-2Di,S	0.000	-6514.838	11231.168	-NA-	0.000	0.000
B2	16-2Lr	0.000	-8410.382	14124.918	-NA-	0.000	0.000
B2	16-3Lr,L	0.000	-12580.579	20491.168	-NA-	0.000	0.000
B2	16-3Lr,W »+Y	0.000	**-14041.407**	**21455.128**	-NA-	0.000	0.000
B2	16-3R,W »+Y	0.000	-7975.667	12195.128	-NA-	0.000	0.000
B2	16-4Lr »+Y	0.000	-11332.039	16052.837	-NA-	0.000	0.000
B2	16-4R »+Y	0.000	-9436.495	13159.087	-NA-	0.000	0.000
B2	16-6 »+Y	0.000	-7807.786	10351.295	-NA-	0.000	0.000
B2	16-6Di	0.000	-4886.129	8423.376	-NA-	0.000	0.000
F01	16-1	0.000	-NA-	**-NA-**	-NA-	-NA-	-NA-
F01	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-1	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-1	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

F10	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-1	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Project: (E) South Wing Steel (R=2.0)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=2.0)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - LRFD Overstrength Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-5 »+Y+30%+X:OS	**0.000**	-127485.178	-75801.729	**-NA-**	**0.000**	**0.000**
B1	16-7 »+Y+30%+X:OS	0.000	-131726.338	**-83113.220**	-NA-	0.000	0.000
B2	16-5 »+Y+30%+X:OS	0.000	**-143127.306**	**102767.765**	-NA-	0.000	0.000
B2	16-7 »+Y+30%+X:OS	0.000	-138886.146	95456.274	-NA-	0.000	0.000
F01	16-5 »+Y+30%+X:OS	0.000	**-NA-**	-NA-	-NA-	-NA-	-NA-
F01	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-5 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-5 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-5 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Steel OMF
South Wing
(R = 3.5)

(E) South Wing Steel (R=3.5)
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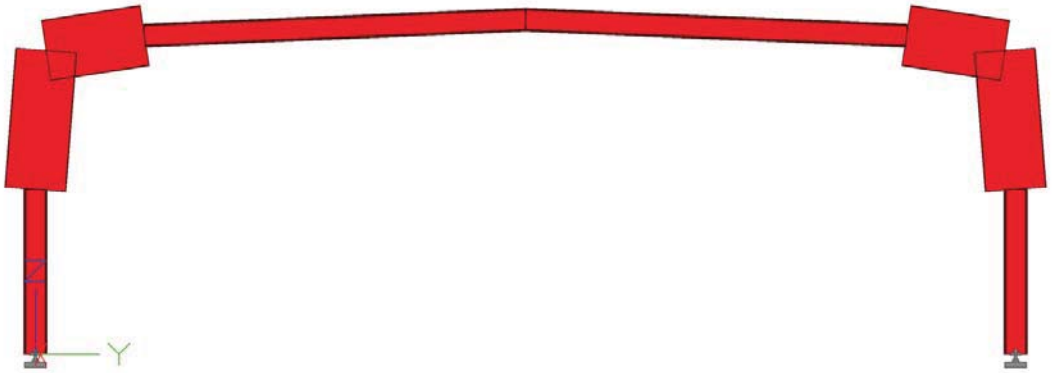
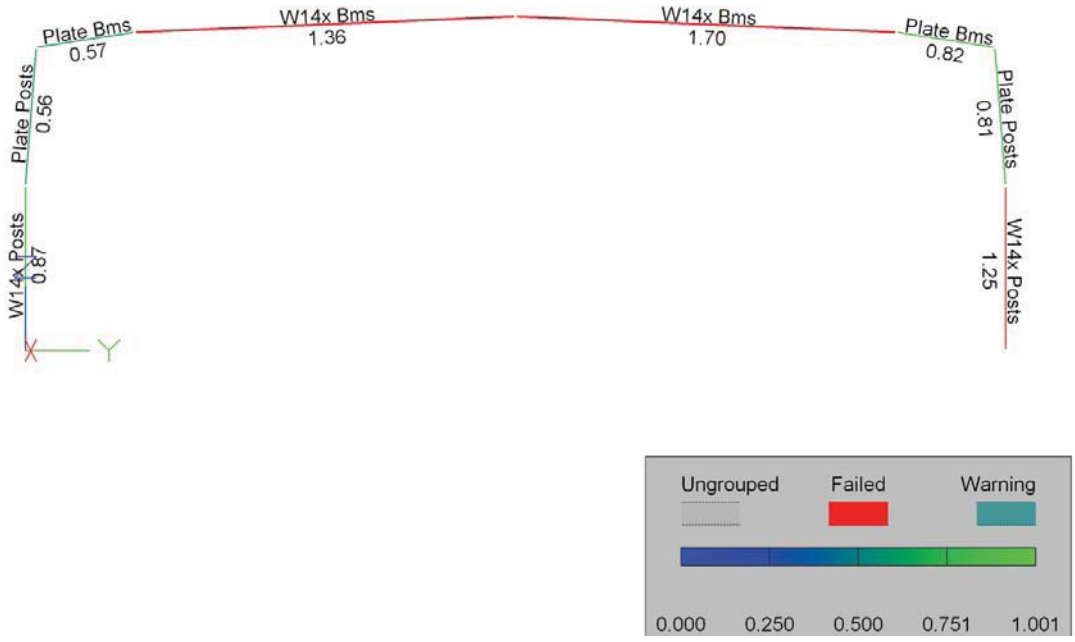
Mar 22, 2023, 05:59 PM
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:58 PM
Design View, Unity Checks
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:58 PM
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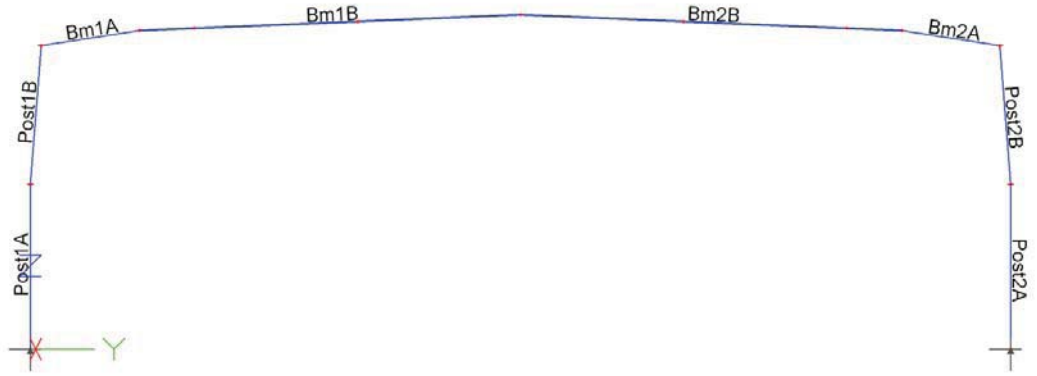

(E) South Wing Steel (R=3.5)
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Mar 22, 2023, 05:58 PM
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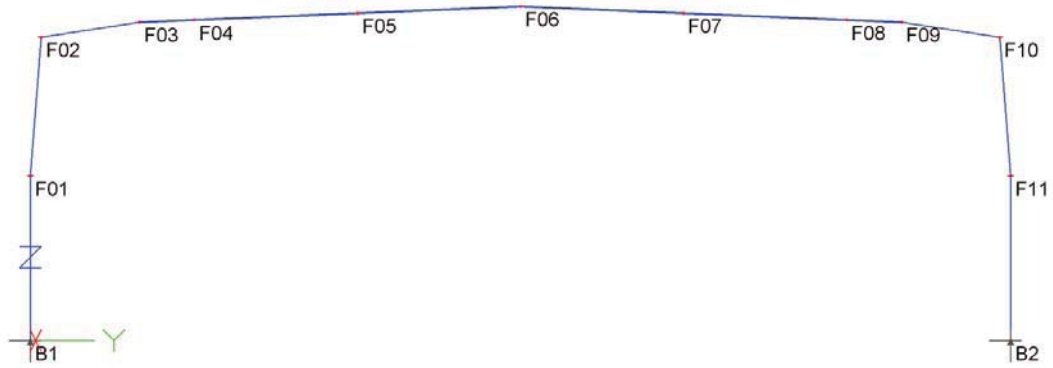
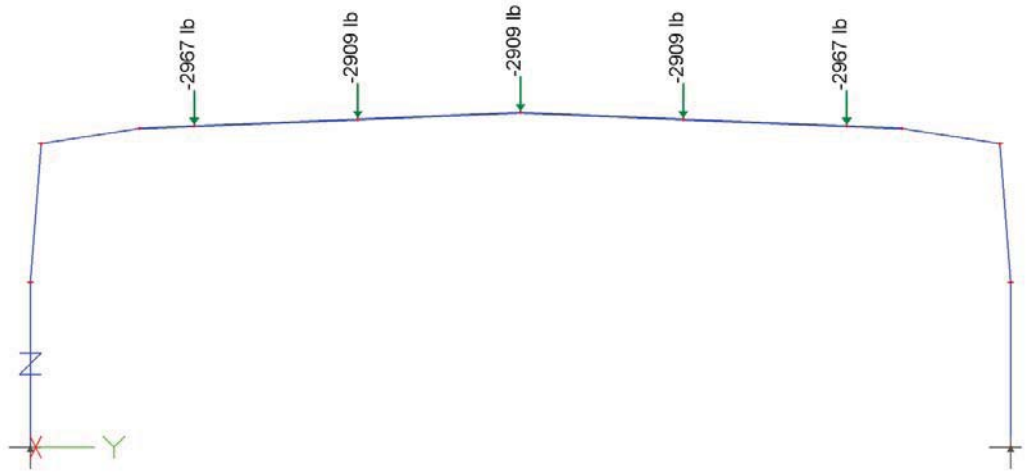
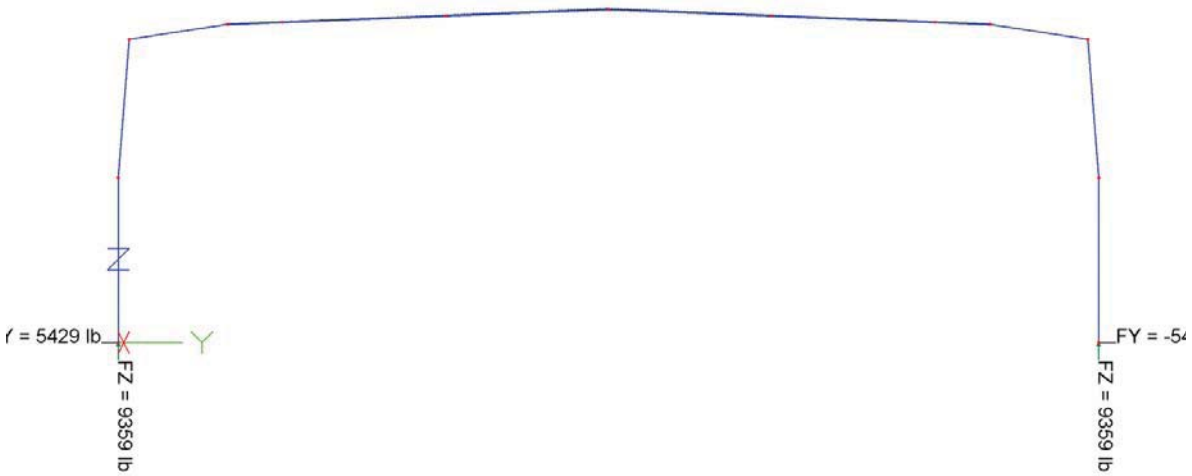


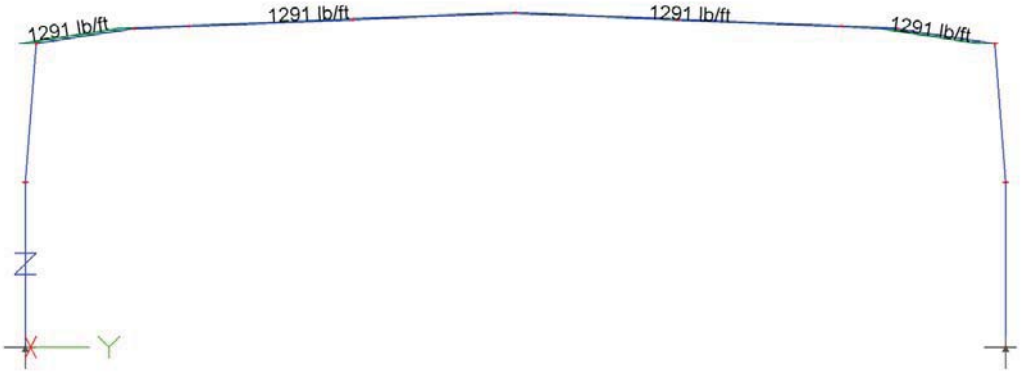
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:56 PM
Load Case: D
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:55 PM
Result Case: D
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:57 PM
Load Case: E+Y
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
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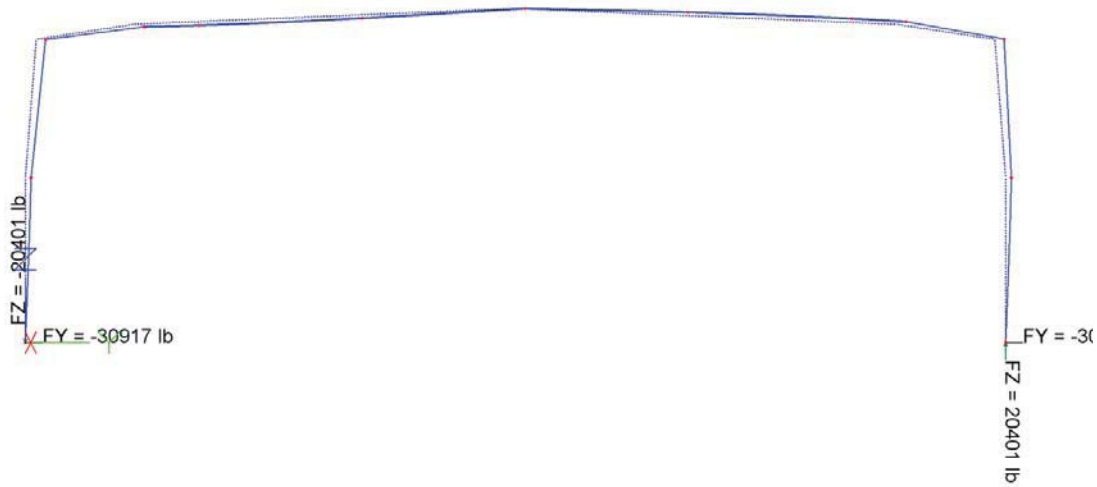
Result Case: E+Y
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
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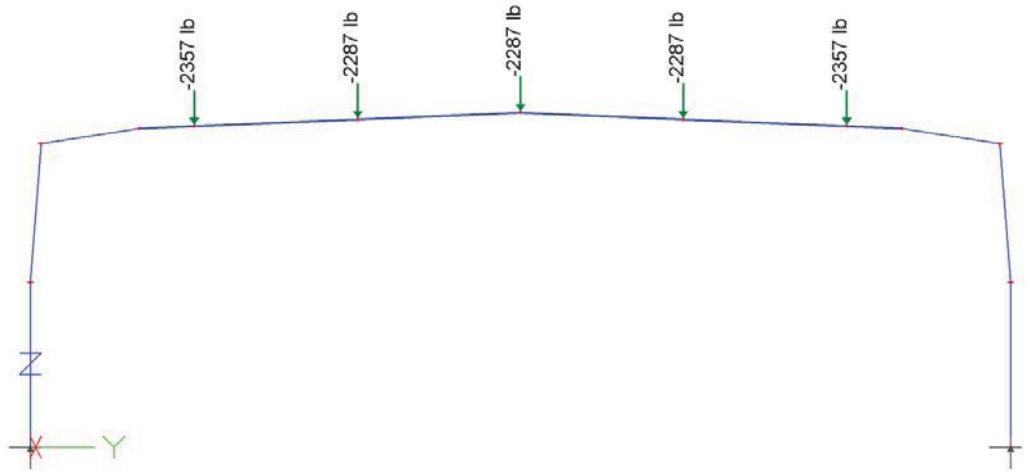
Mar 22, 2023, 05:57 PM
Load Case: Lr
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
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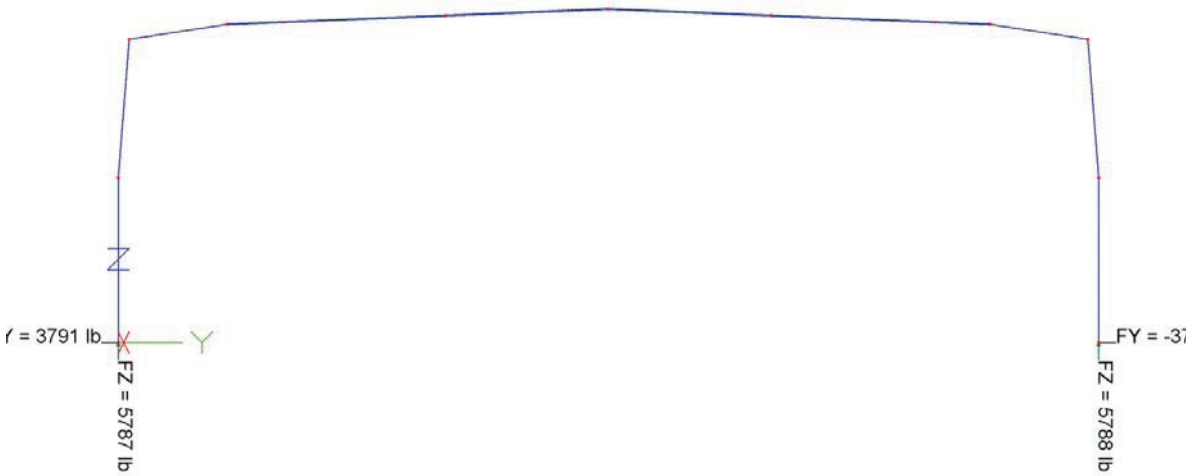
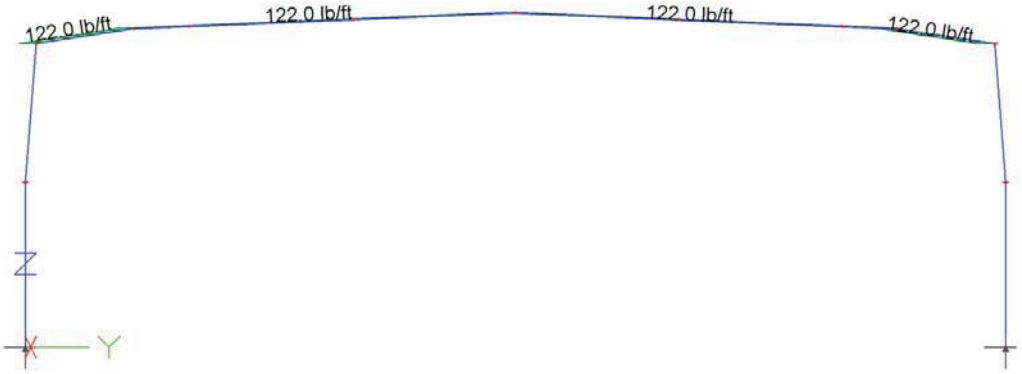
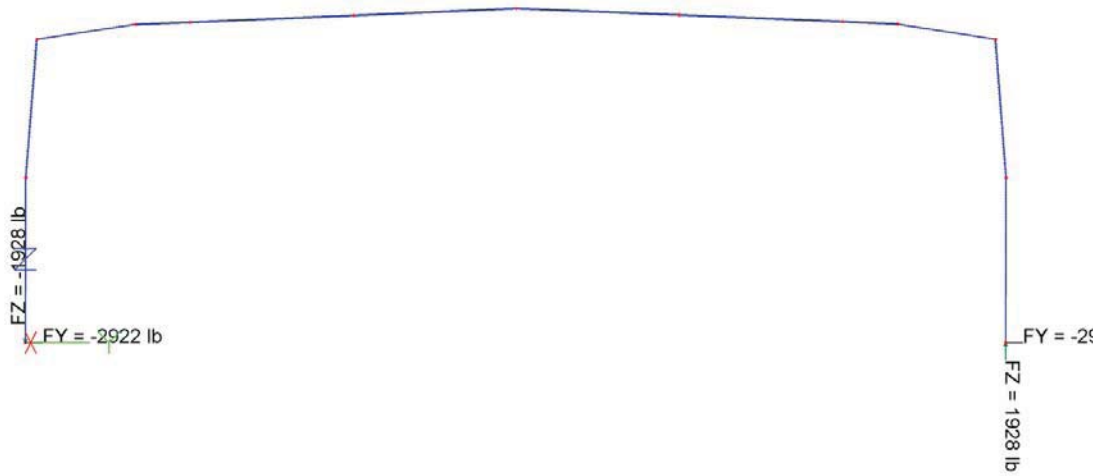
Mar 22, 2023, 05:55 PM
Result Case: Lr
IES VisualAnalysis 12.00.0016



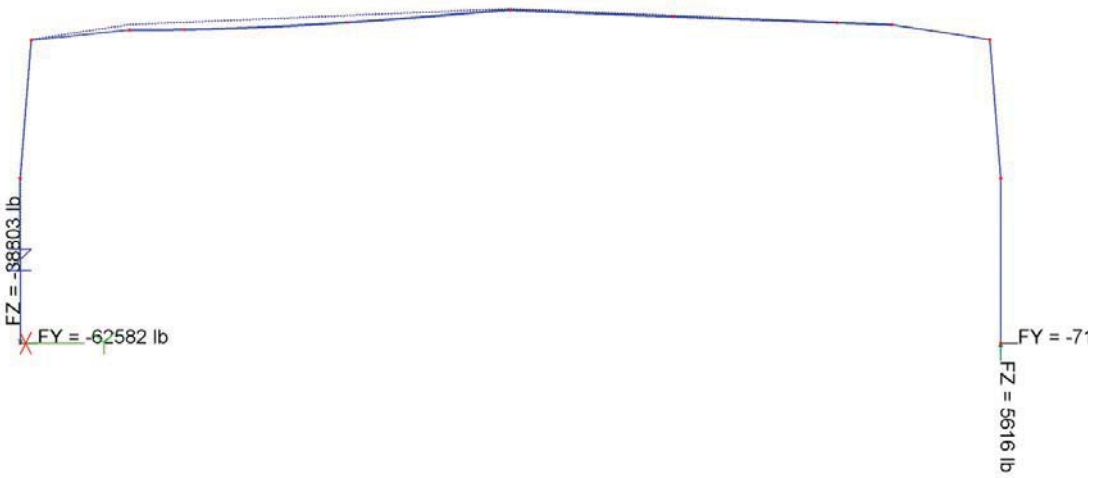
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:57 PM
Load Case: W+Y
IES VisualAnalysis 12.00.0016



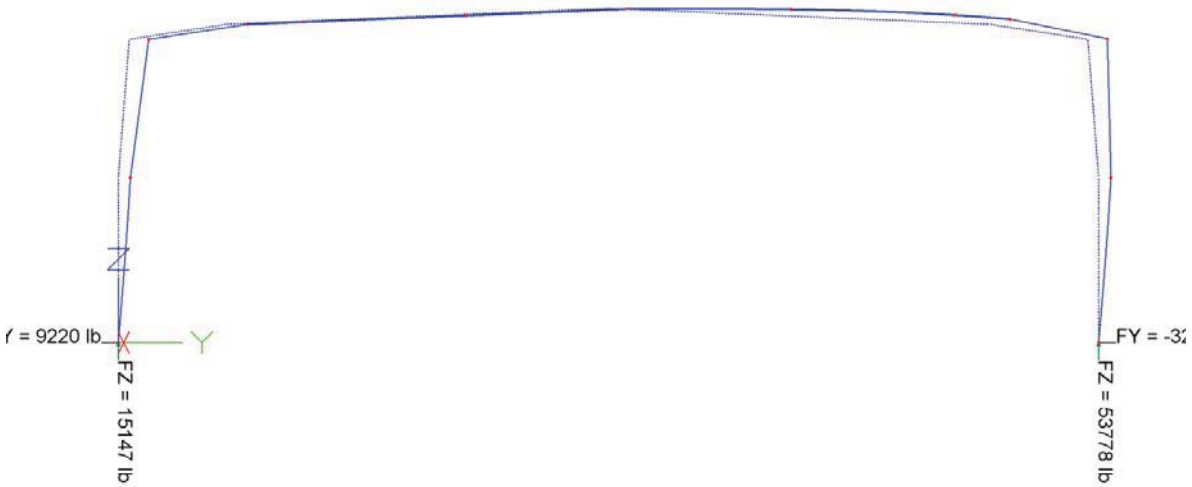
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:55 PM
Result Case: W+Y
IES VisualAnalysis 12.00.0016



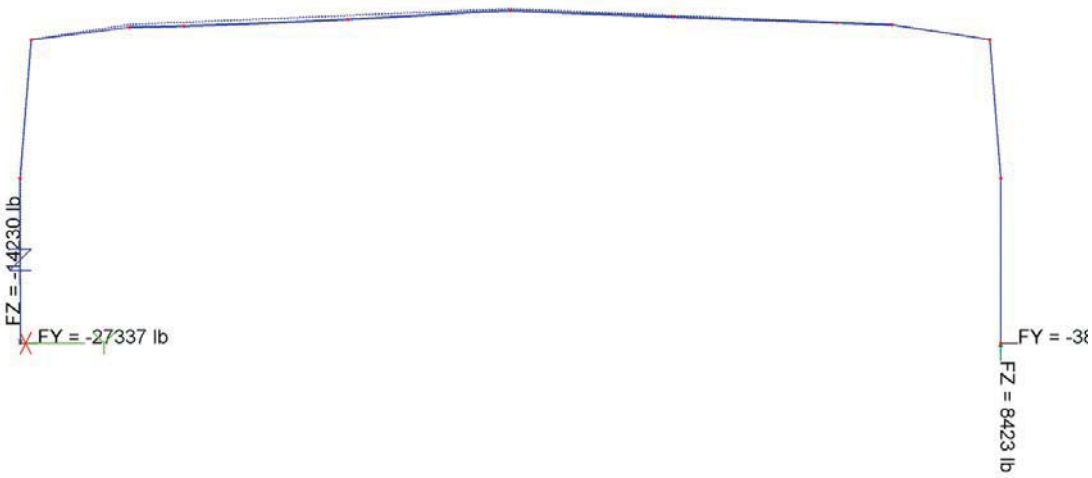
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:55 PM
Result Case: ASD Envelope Low Extreme
IES VisualAnalysis 12.00.0016



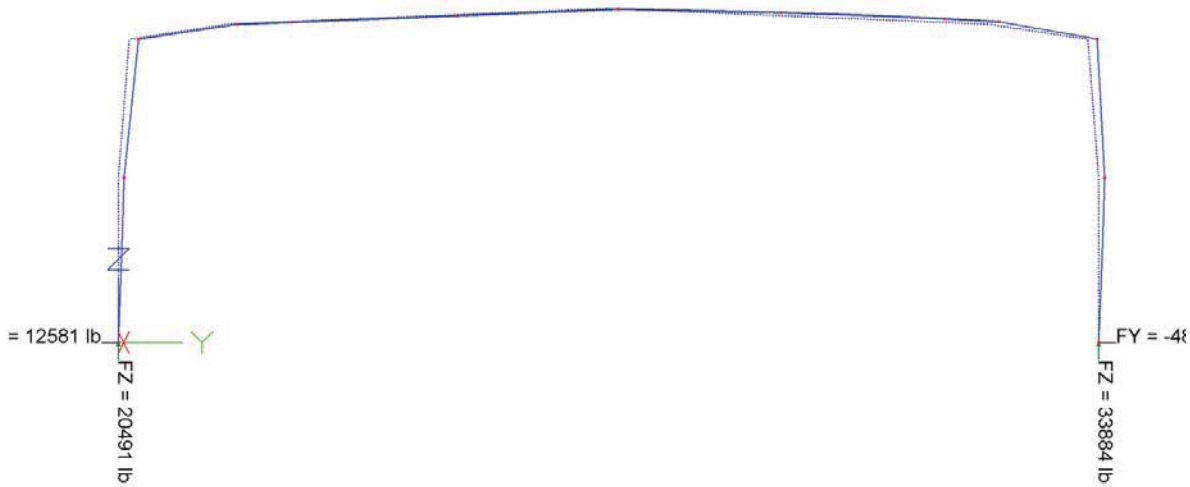
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:55 PM
Result Case: ASD Envelope High Extreme
IES VisualAnalysis 12.00.0016



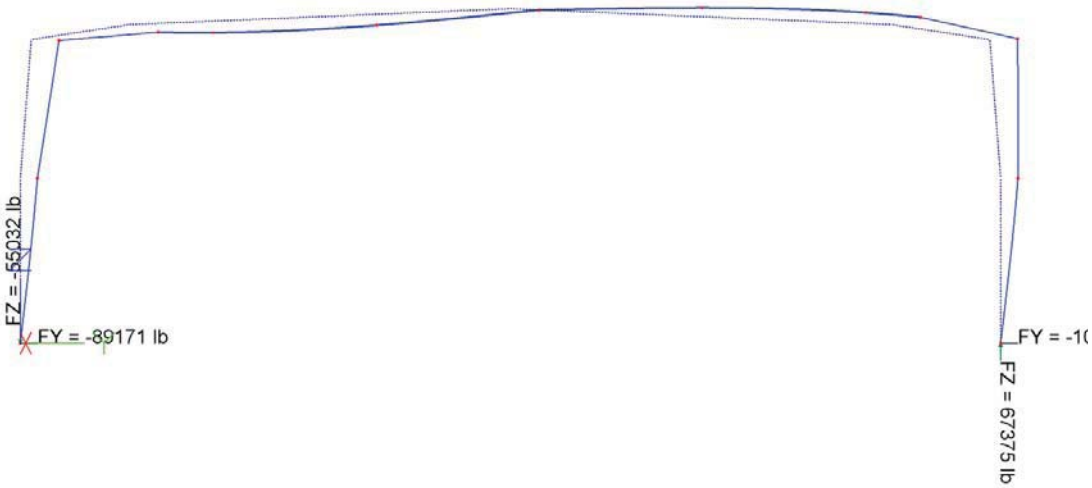
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:56 PM
Result Case: LRFD Envelope Low Extreme
IES VisualAnalysis 12.00.0016



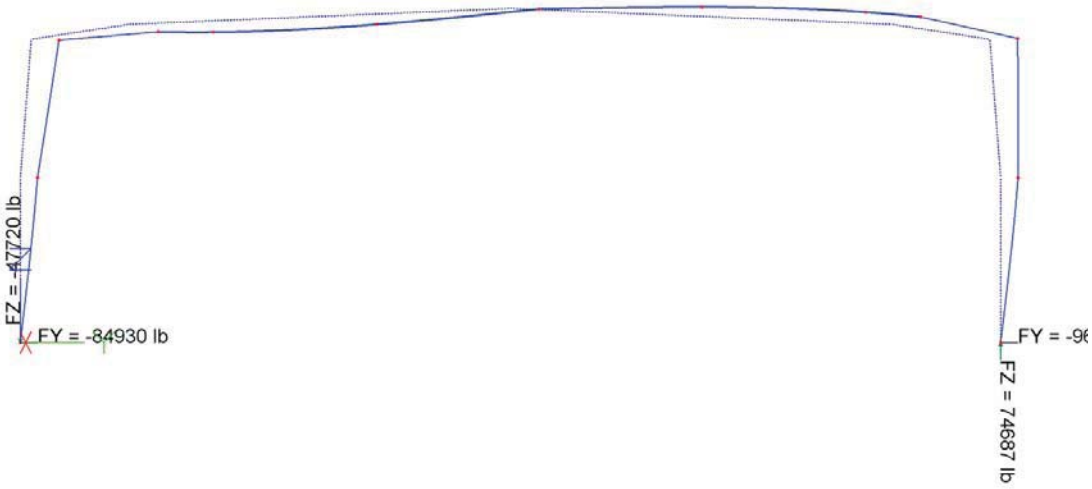
(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:56 PM
Result Case: LRFD Envelope High Extreme
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:56 PM
Result Case: LRFD Overstrength Envelope Low Extreme
IES VisualAnalysis 12.00.0016



(E) South Wing Steel (R=3.5)
COVENANT ENGINEERING, T. Merritt Mavy, P.E.
Mar 22, 2023, 05:56 PM
Result Case: LRFD Overstrength Envelope High Extreme
IES VisualAnalysis 12.00.0016



Project: (E) South Wing Steel (R=3.5)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis

Table of Contents

Analysis Settings

Static Analysis Method: First Order
Automatic Meshing Total Element Count: 300
No Mode Shapes Are Calculated

Model Summary

Structure Type: Space Frame
13 Nodes, and 88 Degrees of Freedom
8 Member Elements
The model is linear.
The model will have 64 unique mode shapes.
The size of the model is:
0 ft, in the X direction
48.83 ft, in the Y direction
16.67 ft, in the Z direction

Equation Load Combinations

Load Case	*Cases*	*Equation*
0.75(D+L+W) »+Y	2	0.75D + 0.75W+Y
16-1	1	1.40D
16-2Di,S	1	1.20D
16-2Lr	2	1.20D + 0.50Lr
16-3Lr,L	2	1.20D + 1.60Lr
16-3Lr,W »+Y	3	1.20D + 1.60Lr + 0.50W+Y
16-3R,W »+Y	2	1.20D + 0.50W+Y
16-4Lr »+Y	3	1.20D + 0.50Lr + W+Y
16-4R »+Y	2	1.20D + W+Y
16-5 »+Y+30%+X	2	1.44D + E+Y
16-5 »+Y+30%+X:OS	2	1.44D + 3.00E+Y
16-6 »+Y	2	0.90D + W+Y
16-6Di	1	0.90D
16-7 »+Y+30%+X	2	0.66D + E+Y
16-7 »+Y+30%+X:OS	2	0.66D + 3.00E+Y
16-10Lr	2	D + Lr
16-10R	1	D
16-11Lr	2	D + 0.75Lr

16-12E »+Y+30%+X	2	1.17D + 0.70E+Y
16-12E »+Y+30%+X:OS	2	1.17D + 2.10E+Y
16-12W »+Y	2	D + 0.60W+Y
16-13Lr »+Y	3	D + 0.75Lr + 0.45W+Y
16-13R »+Y	2	D + 0.45W+Y
16-14 »+Y+30%+X	2	1.13D + 0.53E+Y
16-14 »+Y+30%+X:OS	2	1.13D + 1.58E+Y
16-15 »+Y	2	0.60D + 0.60W+Y
16-15Di	1	0.60D
16-16 »+Y+30%+X	2	0.43D + 0.70E+Y
16-16 »+Y+30%+X:OS	2	0.43D + 2.10E+Y
D+L	1	D
D+Lr+R	2	D + Lr
Live	1	+ Lr
Seismic »+Y	1	E+Y
Wind »+Y	1	W+Y

Statics Check

Result Case Name	Status	Error FX	Error FY	Error FZ
		lb	*lb*	*lb*
0.75(D+L+W) »+Y	OK	0.000	-0.000	-0.000
16-1	OK	0.000	-0.000	-0.000
16-10Lr	OK	0.000	-0.000	-0.000
16-10R	OK	0.000	-0.000	-0.000
16-11Lr	OK	0.000	-0.000	0.000
16-12E »+Y+30%+X	1.1% RX	0.000	-0.000	-0.000
16-12E »+Y+30%+X:OS	1.6% RX	0.000	-0.000	-0.000
16-12W »+Y	OK	0.000	-0.000	-0.000
16-13Lr »+Y	OK	0.000	-0.000	-0.000
16-13R »+Y	OK	0.000	-0.000	-0.000
16-14 »+Y+30%+X	OK	0.000	-0.000	-0.000
16-14 »+Y+30%+X:OS	1.6% RX	0.000	-0.000	-0.000
16-15 »+Y	OK	0.000	-0.000	-0.000
16-15Di	OK	0.000	-0.000	-0.000
16-16 »+Y+30%+X	OK	0.000	-0.000	-0.000
16-16 »+Y+30%+X:OS	OK	0.000	-0.000	-0.000
16-2Di,S	OK	0.000	-0.000	-0.000
16-2Lr	OK	0.000	-0.000	-0.000
16-3Lr,L	OK	0.000	-0.000	-0.000
16-3Lr,W »+Y	OK	0.000	-0.000	-0.000
16-3R,W »+Y	OK	0.000	-0.000	-0.000
16-4Lr »+Y	OK	0.000	-0.000	-0.000
16-4R »+Y	OK	0.000	-0.000	-0.000
16-5 »+Y+30%+X	1.6% RX	0.000	-0.000	-0.000
16-5 »+Y+30%+X:OS	2.0% RX	0.000	-0.000	-0.000
16-6 »+Y	OK	0.000	-0.000	-0.000
16-6Di	OK	0.000	-0.000	-0.000
16-7 »+Y+30%+X	OK	0.000	-0.000	-0.000
16-7 »+Y+30%+X:OS	OK	0.000	-0.000	-0.000
ASD Envelope High Extreme	OK	0.000	0.000	0.000
ASD Envelope Low Extreme	OK	0.000	0.000	0.000
All Load Cases Envelope High Extreme	OK	0.000	0.000	0.000
All Load Cases Envelope Low Extreme	OK	0.000	0.000	0.000
D	OK	0.000	-0.000	-0.000

D+L	OK	0.000	-0.000	-0.000
D+Lr+R	OK	0.000	-0.000	-0.000
E+Y	OK	0.000	-0.000	-0.000
LRFD Envelope High Extreme	OK	0.000	0.000	0.000
LRFD Envelope Low Extreme	OK	0.000	0.000	0.000
LRFD Overstrength Envelope High Extreme	OK	0.000	0.000	0.000
LRFD Overstrength Envelope Low Extreme	OK	0.000	0.000	0.000
Live	OK	0.000	-0.000	0.000
Lr	OK	0.000	-0.000	0.000
Seismic »+Y	OK	0.000	-0.000	-0.000
Serviceabilty Envelope High Extreme	OK	0.000	0.000	0.000
Serviceabilty Envelope Low Extreme	OK	0.000	0.000	0.000
W+Y	OK	0.000	-0.000	-0.000
Wind »+Y	OK	0.000	-0.000	-0.000

Nodes

Node	X	Y	Z	Fix DX	Fix DY	Fix DZ	Fix RX	Fix RY	Fix RZ
	ft	*ft*	*ft*						
B1	0.000	0.000	0.000	Yes	Yes	Yes	No	Yes	Yes
B2	0.000	48.833	0.000	Yes	Yes	Yes	No	Yes	Yes
F01	0.000	0.000	8.208	Yes	No	No	No	No	No
F02	0.000	0.542	15.129	Yes	No	No	No	No	No
F03	0.000	5.436	15.875	No	No	No	No	No	No
F04	0.000	8.165	15.989	No	No	No	No	No	No
F05	0.000	16.312	16.328	No	No	No	No	No	No
F06	0.000	24.417	16.666	No	No	No	No	No	No
F07	0.000	32.521	16.328	No	No	No	No	No	No
F08	0.000	40.668	15.989	No	No	No	No	No	No
F09	0.000	43.398	15.875	No	No	No	No	No	No
F10	0.000	48.292	15.129	Yes	No	No	No	No	No
F11	0.000	48.833	8.208	Yes	No	No	No	No	No

Member Elements

Member	Section	Material	(1)Node	(2)Node	Length	Rz 1	Rz 2	One Way	Framing
					ft				
Bm1A	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F03	F02	4.951	Rigid	Rigid	Normal (2-way)	Beam
Bm1B	W14x43	ASTM A992 Grade 50	F06	F03	18.997	Rigid	Rigid	Normal (2-way)	Beam
Bm2A	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F10	F09	4.951	Rigid	Rigid	Normal (2-way)	Beam
Bm2B	W14x43	ASTM A992 Grade 50	F09	F06	18.997	Rigid	Rigid	Normal (2-way)	Beam
Post1A	W14x43	ASTM A992 Grade 50	F01	B1	8.208	Rigid	Rigid	Normal (2-way)	Column
Post1B	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F02	F01	6.942	Rigid	Rigid	Normal (2-way)	Column
Post2A	W14x43	ASTM A992 Grade 50	B2	F11	8.208	Rigid	Rigid	Normal (2-way)	Column
Post2B	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	F11	F10	6.942	Rigid	Rigid	Normal (2-way)	Column

Project: (E) South Wing Steel (R=3.5)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis

Nodal Loads

Load Case	Node	Direction	Force	Moment
			lb	*lb-ft*
D	F04	DZ	-2967.000	0.000
D	F05	DZ	-2909.000	0.000
D	F06	DZ	-2909.000	0.000
D	F07	DZ	-2909.000	0.000
D	F08	DZ	-2967.000	0.000
Lr	F04	DZ	-2357.000	0.000
Lr	F05	DZ	-2287.000	0.000
Lr	F06	DZ	-2287.000	0.000
Lr	F07	DZ	-2287.000	0.000
Lr	F08	DZ	-2357.000	0.000

Member Uniform Loads

Load Case	Member	Direction	Offset	End Offset	Force	Moment
			ft	*ft*	*lb/ft*	*ft-lb/ft*
E+Y	Bm1A	Force Y	0.000	4.951	1291.000	-NA-
E+Y	Bm1B	Force Y	0.000	18.997	1291.000	-NA-
E+Y	Bm2A	Force Y	0.000	4.951	1291.000	-NA-
E+Y	Bm2B	Force Y	0.000	18.997	1291.000	-NA-
W+Y	Bm1A	Force Y	0.000	4.951	122.000	-NA-
W+Y	Bm1B	Force Y	0.000	18.997	122.000	-NA-
W+Y	Bm2A	Force Y	0.000	4.951	122.000	-NA-
W+Y	Bm2B	Force Y	0.000	18.997	122.000	-NA-

Member Stresses

Member	+fa	-fa	+fbz	-fbz	+fby	-fby	fvy	fvz
	psf	*psf*	*psf*	*psf*	*psf*	*psf*	*psf*	*psf*
Bm1A	654666.326	-104240.912	9685600.930	-9685600.930	0.000	-0.000	-302785.323	-0.000
Bm1B	825835.432	-152710.065	30523393.117	-30523393.117	0.000	-0.000	-689613.891	-0.000
Bm2A	0.000	-749357.184	10879014.628	-10879014.628	0.000	-0.000	405828.057	-0.000
Bm2B	0.000	-964158.439	32882675.437	-32882675.437	0.000	-0.000	797242.644	-0.000
Post1A	631593.147	-234184.775	20204435.336	-20204435.336	0.000	-0.000	1019094.016	0.000
Post1B	423084.522	-142344.037	9685600.930	-9685600.930	0.000	-0.000	573663.747	-0.000
Post2A	0.000	-853560.277	22787683.308	-22787683.308	0.000	-0.000	-1149390.780	0.000
Post2B	0.000	-554763.230	10879014.628	-10879014.628	0.000	-0.000	-641122.837	-0.000

Member End Reactions (Extreme Rows Only)

Member	Result Case Name	Offset	Fx	Vy	Vz	Mx	My	Mz
		ft	*lb*	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
Bm1A	16-3Lr,L	4.951	-15370.331	17347.205	0.000	0.000	0.000	**179627.479**
Bm1A	16-7 »+Y+30%+X:OS	4.951	**96530.607**	-41522.722	-0.000	0.000	**-0.000**	-1319060.069
Bm1B	16-7 »+Y+30%+X:OS	18.997	72260.603	-52869.449	**0.000**	-0.000	0.000	-1105766.414
Bm2A	16-5 »+Y+30%+X:OS	0.000	**-110492.782**	57460.083	-0.000	**0.000**	0.000	**-1481588.380**
Bm2B	16-5 »+Y+30%+X:OS	0.000	-84363.866	69487.142	**-0.000**	**-0.000**	**0.000**	-1191235.783
Post1A	16-7 »+Y+30%+X:OS	0.000	55264.402	**89170.729**	0.000	-0.000	-0.000	-731943.068
Post2A	16-5 »+Y+30%+X:OS	0.000	-74686.527	**-100571.696**	0.000	0.000	-0.000	0.000

Design Groups

Group/Mesh	*Elements*	*Unity*	*Design Shape*	*Design Material*	*Overstrength*	*Specification*
Plate Bms	2	0.82	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	No	AISC LRFD

						(2010)
Plate Posts	2	0.81	I-Beam 35.8 x 0.325 x 8 x 0.625	ASTM A36	No	AISC LRFD (2010)
W14x Bms	2	1.70	-NA-	ASTM A992 Grade 50	No	AISC LRFD (2010)
W14x Posts	2	1.25	-NA-	ASTM A992 Grade 50	No	AISC LRFD (2010)

Design Group Results

Design Group: W14x Bms per AISC LRFD (2010)

FAIL! Worst case unity = 1.704
Checked As: W14x43, Material: \Steel\ASTM A992 Grade 50
Members Included (2): Bm1B, Bm2B

Strong Deflection Check

Member Name	Result Case	Offset ft	Demand dy in	Capacity dy in	Code Ref.	Unity Check	Details
Bm1B	Seismic »+Y	10.948	1.230	1.266	IBC 1604.3.1	0.97 OK	
Bm2B	Seismic »+Y	8.050	1.230	1.266	IBC 1604.3.1	0.97 OK	

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	H1-1b	**1.36 FAIL**	Cb = 1.539 , Lb = 18.997 ft
Bm2B	16-5 »+Y+30%+X	0.000	H1-1b	**1.70 FAIL**	KLz = 18.997 ft, KLy = 2.732 ft, Kz = 1.000 , Ky = 1.000 , Cb = 1.901 , Lb = 18.997 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	21553.251	567000.017	D2-1	0.04 OK	
Bm2B	16-5 »+Y+30%+X	0.000	33656.515	506991.191	E3-2FB	0.07 OK	KLz = 18.997 ft, KLy = 2.732 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	18.997	-350697.217	260999.994	F2-1	**1.34 FAIL**	Lb = 18.997 ft, Cb = 1.539
Bm2B	16-5 »+Y+30%+X	0.000	-436166.586	260999.994	F2-1	**1.67 FAIL**	Lb = 18.997 ft, Cb = 1.901

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Bm1B	16-7 »+Y+30%+X	0.000	-19574.251	125355.001	G2-1	0.16 OK	
Bm2B	16-5 »+Y+30%+X	0.000	30762.206	125355.001	G2-1	0.25 OK	

Design Group: W14x Posts per AISC LRFD (2010)

FAIL! Worst case unity = 1.252
Checked As: W14x43, Material: \Steel\ASTM A992 Grade 50
Members Included (2): Post2A, Post1A

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Post2A	16-5 »+Y+30%+X	8.208	H1-1b	**1.25 FAIL**	KLz = 8.208 ft, KLy = 7.158 ft, Kz = 1.000 , Ky = 0.872 , Cb = 1.667 , Lb = 8.208 ft
Post1A	16-7 »+Y+30%+X	0.000	H1-1b	0.87 OK	Cb = 1.667 , Lb = 8.208 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Post2A	16-5 »+Y+30%+X	0.000	33884.187	487837.911	E3-2FB	0.07 OK	KLz = 8.208 ft, KLy = 7.158 ft
Post1A	16-3Lr,L	8.208	20491.168	487837.911	E3-2FB	0.04 OK	KLz = 8.208 ft, KLy = 7.158 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Post2A	16-5 »+Y+30%+X	8.208	-317973.933	260999.994	F2-1	**1.22 FAIL**	Lb = 8.208 ft, Cb = 1.667
Post1A	16-7 »+Y+30%+X	0.000	-224390.994	260999.994	F2-1	0.86 OK	Lb = 8.208 ft, Cb = 1.667

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Post2A	16-5 »+Y+30%+X	8.208	-38737.941	125355.001	G2-1	0.31 OK	
Post1A	16-7 »+Y+30%+X	8.208	27336.974	125355.001	G2-1	0.22 OK	

Design Group: Plate Bms per AISC LRFD (2010)

Designed As: I-Beam 35.8 x 0.325 x 8 x 0.625, Material: \Steel\ASTM A36
Members Included (2): Bm2A, Bm1A

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details

Bm2A	16-5 »+Y+30%+X	0.000	H1-1b	0.82 OK	KL = 4.951 ft, Cb = 1.102 , Lb = 4.951 ft
Bm1A	16-7 »+Y+30%+X	4.951	H1-1b	0.57 OK	Cb = 1.056 , Lb = 4.951 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Bm2A	16-5 »+Y+30%+X	0.000	43216.295	473236.466	E7-2FB	0.09 OK	Lu = 4.951 ft, KL = 4.951 ft
Bm1A	16-7 »+Y+30%+X	4.951	29254.120	687943.125	D2-1	0.04 OK	

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details
Bm2A	16-5 »+Y+30%+X	0.000	-568192.407	737089.255	F2-1	0.77 OK	Lb = 4.951 ft, Cb = 1.102
Bm1A	16-7 »+Y+30%+X	4.951	-405664.097	737089.255	F2-1	0.55 OK	Lb = 4.951 ft, Cb = 1.056

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Bm2A	16-5 »+Y+30%+X	4.951	26895.028	121678.300	G2-1	0.22 OK	
Bm1A	16-3Lr,L	4.951	17347.205	121678.300	G2-1	0.14 OK	

Design Group: Plate Posts per AISC LRFD (2010)

Designed As: I-Beam 35.8 x 0.325 x 8 x 0.625, Material: \Steel\ASTM A36
Members Included (2): Post2B, Post1B

Combined Check

Member Name	Result Case	Offset ft	Code Ref.	Unity Check	Details
Post2B	16-5 »+Y+30%+X	6.942	H1-1b	0.81 OK	KL = 6.942 ft, Cb = 1.214 , Lb = 6.942 ft
Post1B	16-7 »+Y+30%+X	0.000	H1-1b	0.56 OK	Cb = 1.218 , Lb = 6.942 ft

Axial Check

Member Name	Result Case	Offset ft	Demand Fx lb	Capacity Fx lb	Code Ref.	Unity Check	Details
Post2B	16-5 »+Y+30%+X	0.000	36297.256	453923.439	E7-2FB	0.08 OK	Lu = 6.942 ft, KL = 6.942 ft
Post1B	16-3Lr,L	6.942	20988.641	453923.439	E7-2FB	0.05 OK	Lu = 6.942 ft, KL = 6.942 ft

Strong Flexure Check

Member Name	Result Case	Offset ft	Demand Mz lb-ft	Capacity Mz lb-ft	Code Ref.	Unity Check	Details

Post2B	16-5 »+Y+30%+X	6.942	-568192.407	737089.255	F2-1	0.77 OK	Lb = 6.942 ft, Cb = 1.214
Post1B	16-7 »+Y+30%+X	0.000	-405664.097	737089.255	F2-1	0.55 OK	Lb = 6.942 ft, Cb = 1.218

Strong Shear Check

Member Name	Result Case	Offset ft	Demand Vy lb	Capacity Vy lb	Code Ref.	Unity Check	Details
Post2B	16-5 »+Y+30%+X	6.942	-36072.051	121678.300	G2-1	0.30 OK	
Post1B	16-7 »+Y+30%+X	6.942	26125.203	121678.300	G2-1	0.21 OK	

Project: (E) South Wing Steel (R=3.5)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=3.5)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - Load Case Results

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	D	-0.000	**5429.032**	9359.307	**-NA-**	-0.000	0.000
B1	E+Y	-0.000	**-30916.878**	**-20401.170**	-NA-	-0.000	**0.000**
B1	Lr	-0.000	3791.088	5787.500	-NA-	-0.000	0.000
B1	W+Y	-0.000	-2921.657	-1927.918	-NA-	-0.000	0.000
B2	D	-0.000	-5429.032	9359.307	-NA-	-0.000	-0.000
B2	E+Y	**-0.000**	-30916.878	**20401.170**	-NA-	**-0.000**	**-0.000**
B2	Lr	-0.000	-3791.088	5787.500	-NA-	-0.000	-0.000
B2	W+Y	-0.000	-2921.657	1927.918	-NA-	-0.000	-0.000
F01	D	0.000	-NA-	-NA-	-NA-	**-NA-**	-NA-
F01	E+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	D	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	E+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	Lr	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	W+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	E+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	W+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	D	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	E+Y	**0.000**	-NA-	-NA-	-NA-	-NA-	-NA-
F11	Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	W+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Project: (E) South Wing Steel (R=3.5)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=3.5)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - ASD Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-10Lr	-0.000	**9220.120**	15146.807	**-NA-**	-0.000	0.000
B1	16-10R	-0.000	5429.032	9359.307	-NA-	-0.000	0.000
B1	16-11Lr	-0.000	8272.348	13699.932	-NA-	-0.000	0.000
B1	16-12W »+Y	-0.000	3676.038	8202.556	-NA-	-0.000	**0.000**
B1	16-13Lr »+Y	-0.000	6957.602	12832.369	-NA-	-0.000	0.000
B1	16-13R »+Y	-0.000	4114.286	8491.744	-NA-	-0.000	0.000
B1	16-15 »+Y	-0.000	1504.425	4458.833	-NA-	-0.000	0.000
B1	16-15Di	-0.000	3257.419	5615.584	-NA-	-0.000	0.000
B2	16-10Lr	-0.000	-9220.120	**15146.807**	-NA-	-0.000	-0.000
B2	16-10R	-0.000	-5429.032	9359.307	-NA-	-0.000	-0.000
B2	16-11Lr	-0.000	-8272.348	13699.932	-NA-	-0.000	-0.000
B2	16-12W »+Y	-0.000	-7182.026	10516.058	-NA-	-0.000	-0.000
B2	16-13Lr »+Y	**-0.000**	**-9587.093**	14567.495	-NA-	**-0.000**	**-0.000**
B2	16-13R »+Y	-0.000	-6743.778	10226.870	-NA-	-0.000	-0.000
B2	16-15 »+Y	-0.000	-5010.413	6772.335	-NA-	-0.000	-0.000
B2	16-15Di	-0.000	-3257.419	5615.584	-NA-	-0.000	-0.000
F01	16-10Lr	0.000	-NA-	**-NA-**	-NA-	**-NA-**	-NA-
F01	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-13Lr »+Y	**0.000**	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-10Lr	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-10R	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-11Lr	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-12W »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-13Lr »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-13R »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-15 »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-15Di	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-10Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-12W »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-13R »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-15 »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-10Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-10R	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-11Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-12W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-13Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

F11	16-13R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-15 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-15Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Project: (E) South Wing Steel (R=3.5)
T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023
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(E) South Wing Steel (R=3.5)

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Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - LRFD Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-1	-0.000	7600.645	13103.030	**-NA-**	-0.000	0.000
B1	16-2Di,S	-0.000	6514.838	11231.168	-NA-	-0.000	0.000
B1	16-2Lr	-0.000	8410.382	14124.918	-NA-	-0.000	0.000
B1	16-3Lr,L	-0.000	**12580.579**	20491.168	-NA-	-0.000	0.000
B1	16-3Lr,W »+Y	-0.000	11119.750	19527.209	-NA-	-0.000	0.000
B1	16-3R,W »+Y	-0.000	5054.010	10267.209	-NA-	-0.000	0.000
B1	16-4Lr »+Y	-0.000	5488.725	12197.000	-NA-	-0.000	**0.000**
B1	16-4R »+Y	-0.000	3593.182	9303.250	-NA-	-0.000	0.000
B1	16-6 »+Y	-0.000	1964.472	6495.458	-NA-	-0.000	0.000
B1	16-6Di	-0.000	4886.129	8423.376	-NA-	-0.000	0.000
B2	16-1	-0.000	-7600.645	13103.030	-NA-	-0.000	-0.000
B2	16-2Di,S	-0.000	-6514.838	11231.168	-NA-	-0.000	-0.000
B2	16-2Lr	-0.000	-8410.382	14124.918	-NA-	-0.000	-0.000
B2	16-3Lr,L	-0.000	-12580.579	20491.168	-NA-	-0.000	-0.000
B2	16-3Lr,W »+Y	**-0.000**	**-14041.407**	**21455.128**	-NA-	**-0.000**	**-0.000**
B2	16-3R,W »+Y	-0.000	-7975.667	12195.128	-NA-	-0.000	-0.000
B2	16-4Lr »+Y	-0.000	-11332.039	16052.837	-NA-	-0.000	-0.000
B2	16-4R »+Y	-0.000	-9436.495	13159.087	-NA-	-0.000	-0.000
B2	16-6 »+Y	-0.000	-7807.786	10351.295	-NA-	-0.000	-0.000
B2	16-6Di	-0.000	-4886.129	8423.376	-NA-	-0.000	-0.000
F01	16-1	0.000	-NA-	**-NA-**	-NA-	**-NA-**	-NA-
F01	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3Lr,W »+Y	**0.000**	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F01	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-1	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-2Di,S	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-2Lr	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3Lr,L	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3Lr,W »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-3R,W »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-4Lr »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-4R »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-6 »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-6Di	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-1	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

Project: (E) South Wing Steel (R=3.5)

T. Merritt Mavy, P.E., COVENANT ENGINEERING March 22, 2023

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F10	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-4Lr »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-4R »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-6 »+Y	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-1	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-2Di,S	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-2Lr	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3Lr,L	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3Lr,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-3R,W »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-4Lr »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-4R »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-6 »+Y	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-6Di	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

(E) South Wing Steel (R=3.5)

D:\Dropbox\Engr\Projects\2022\P22081 GAA - Ft Bragg Fire Station\Engr\Analysis\(E) South Wing Steel (R=3.5).vap

Company: COVENANT ENGINEERING Engineer: T. Merritt Mavy, P.E.
VisualAnalysis 12.00.0016 Report

Nodal Reactions - LRFD Overstrength Load Combinations

Node	Result Case Name	FX	FY	FZ	MX	MY	MZ
		lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
B1	16-5 »+Y+30%+X:OS	-0.000	-84929.569	-47720.491	**-NA-**	-0.000	**0.000**
B1	16-7 »+Y+30%+X:OS	-0.000	-89170.729	**-55031.982**	-NA-	-0.000	0.000
B2	16-5 »+Y+30%+X:OS	**-0.000**	**-100571.696**	**74686.527**	-NA-	**-0.000**	**-0.000**
B2	16-7 »+Y+30%+X:OS	-0.000	-96330.536	67375.036	-NA-	-0.000	-0.000
F01	16-5 »+Y+30%+X:OS	0.000	**-NA-**	-NA-	-NA-	**-NA-**	-NA-
F01	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-5 »+Y+30%+X:OS	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F02	16-7 »+Y+30%+X:OS	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-5 »+Y+30%+X:OS	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F10	16-7 »+Y+30%+X:OS	-0.000	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-5 »+Y+30%+X:OS	**0.000**	-NA-	-NA-	-NA-	-NA-	-NA-
F11	16-7 »+Y+30%+X:OS	0.000	-NA-	-NA-	-NA-	-NA-	-NA-

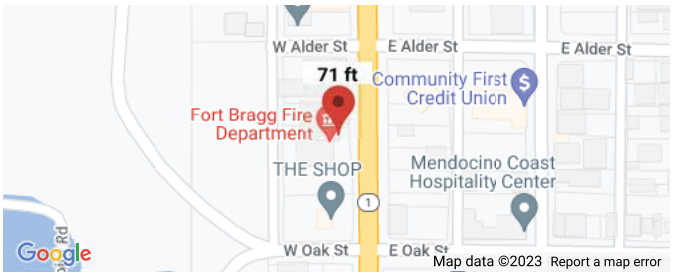
2022 CBC/ASCE 7-16
Site Criteria

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information



Address:	141 N Main St, Fort Bragg, CA 95437, USA
Coordinates:	39.4424057, -123.8062042
Elevation:	71 ft
Timestamp:	2023-03-01T23:53:28.568Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.504	MCE_R ground motion (period=0.2s)
S_1	0.607	MCE_R ground motion (period=1.0s)
S_{MS}	1.805	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.204	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.902	Coefficient of risk (0.2s)
CR_1	0.894	Coefficient of risk (1.0s)
PGA	0.653	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.784	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	1.866	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.069	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.504	Factored deterministic acceleration value (0.2s)
S1RT	0.776	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.868	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.607	Factored deterministic acceleration value (1.0s)
PGAd	0.653	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address: 141 N Main St, Fort Bragg, CA 95437, USA

Coordinates: 39.4424057, -123.8062042

Elevation: 71 ft

Timestamp: 2023-03-01T23:50:14.229Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	63 mph
MRI 25-Year	70 mph
MRI 50-Year	74 mph
MRI 100-Year	78 mph
Risk Category I	86 mph
Risk Category II	91 mph
Risk Category III	98 mph
Risk Category IV	102 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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Covenant Engineering

"WHEN INTEGRITY COUNTS..."

Ft. Bragg Fire Station (E) Structures
Ft. Bragg, CA

CERTIFICATION OF ELECTRONIC FILES

To: Gutierrez Associates
Attn: Efren Gutierrez
315 14th St., 2nd Flr
Oakland, CA 94612

Re: Ft. Bragg Fire Station
(E) Structures Evaluation
141 N Main St.
Ft. Bragg, CA 95437

Date: April 3, 2023

Dear Efren,

This letter is to certify that the structural calculations and accompanying summary letter provided for the above-referenced job have been sealed and certified electronically by the undersigned as of today's date.

If any questions or concerns arise regarding this issue, please feel free to contact our office at your convenience as may be required. Thank you for the opportunity to serve your structural engineering needs.

T. Merritt Mavy, P.E.
C69451, Exp. 06/30/24

Attachments: none
Enclosures: none
CC: none