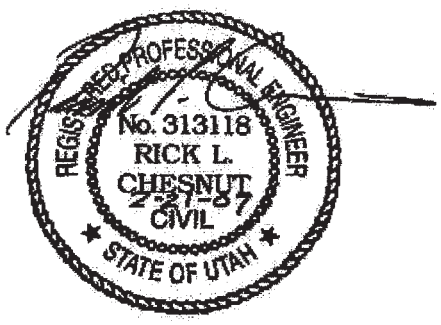
GEOTECHNICAL ENGINEERING REPORT

PANDA EXPRESS RESTAURANT
S8-08-D1322
3650 WEST 13400 SOUTH
RIVERTON, UTAH

Terracon Project No. 61075008
February 21, 2007



Prepared for:

PANDA RESTAURANT GROUP, INC.
1683 Walnut Grove Avenue
Rosemead, California 91770

Prepared by:

TERRACON CONSULTANTS, INC.
12217 South Lone Peak Pkwy. Suite 100
Draper, Utah 84020

Terracon

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February 21, 2007

Panda Restaurant Group, Inc.
1683 Walnut Grove Avenue
Rosemead, California 91770

Attn: Mr. Dalmar Duran

Re: Geotechnical Engineering Report
Panda Express Restaurant
S8-08-D1322
Riverton, Utah
Terracon Project No. 61075008

Gentlemen:

At your request, Terracon Consultants, Inc. (Terracon) has performed a geotechnical exploration at 3650 West 13400 South in Riverton, Utah for the proposed Panda Express Restaurant #S8-08-D1322. This exploration was authorized by Mr. Dalmar Duran through Task Order 92-968N-06, issued under the Masters Service Agreement dated September 20, 2005, and referenced as PandRG.MSA.9.05. The accompanying report describes the exploration, summarizes our findings and presents geotechnical recommendations for the proposed structure, site grading and asphalt pavement section thickness.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
TERRACON CONSULTANTS

Jeff W. Gilbert, E.I.T.
Geotechnical Staff Engineer

Rick L. Chesnut, P.E.
Principal

JWG/RLC/ac
Copies To: Electronic (1) dalmar.duran@PandaRG.com , larry.jackson@PandaRG.com
N:\Projects\2007\61075008\61075008 Panda Riverton_GEO Rpt.doc

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PANDA EXPRESS RESTAURANT
S8-08-D1322
3650 WEST 13400 SOUTH
RIVERTON, UTAH

Terracon Project No. 61075008
February 21, 2007

INTRODUCTION

This report presents the results of a geotechnical exploration for the proposed Panda Express Restaurant at 3650 West 13400 South, in Riverton, Utah. The general location of the site with respect to existing roads is presented on the Project Vicinity Map, included in Appendix A.

The purpose of this exploration was to evaluate subsurface conditions at the site, and provide geotechnical recommendations regarding design of foundations, earthwork and asphalt pavement section thickness design. The scope of work included subsurface exploration, field and laboratory testing, engineering analysis, and the preparation of this report.

PROJECT DESCRIPTION

We understand the proposed project will typically consist of one single-story, wood or metal-framed, slab-on-grade, restaurant building, typically comprising approximately 2,500 square feet (s.f.). It is anticipated that the proposed building will have maximum column loads of 75 kips and continuous wall loads of 3 kips per linear foot. We have assumed the maximum uniform floor slab load is anticipated to be 150 to 200 pounds per square foot (psf). Grade changes are not anticipated to exceed three feet.

Parking areas and service drives will consist of asphalt concrete and rigid cement concrete. Typical traffic flow is expected to be light duty, with some large delivery trucks on a weekly basis. For pavement section design purposes, traffic loads consisting of 10,000 Equivalent Single Axle Loads (ESALs) were assumed for the parking areas. For loading docks and other higher truck traffic areas, 75,000 ESALs were assumed.

Grading plans and finished elevation of the structure were not available at the time this report was prepared. However, we understand that the proposed building will be constructed near the existing site grade.

If structural loads are determined to be greater than those assumed above or if site grading activities vary significantly from that described above, we should be notified immediately so the necessary modifications can be made to our recommendations.

SITE EXPLORATION PROCEDURES

Field Exploration

The subsurface exploration included drilling 2 borings to depths of about 21.5 feet below the existing site grade within the building footprint, and drilling 2 borings to depths of about 6.5 feet below the existing site grade parking areas. The approximate locations of the borings in relation to the proposed construction are shown on the Boring Location Plan, included in Appendix A. The borings were located by reference to existing on-site features. The locations are approximate and should be considered accurate only to the degree implied by the means and methods used to determine them.

The borings were drilled with a truck-mounted rotary drill rig with continuous flight hollow-stem augers. Disturbed soil samples were collected at various depths utilizing a 2-inch outside-diameter split spoon sampler driven in general accordance with the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free-falling through a distance of 30 inches. The number of blows required to advance the sampler the last 12 inches, or the interval indicated, of a typical 18-inch penetration is recorded as the standard penetration resistance value (N-value). These values are indicated on the boring logs at the respective sample depths.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the moisture content. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Terracon personnel prepared boring logs during drilling. The soil samples were packaged and transported to our Draper laboratory for further observation and testing.

Laboratory Testing

Samples obtained during the field exploration were visually classified in the laboratory in general accordance with the Unified Soil Classification System (USCS). The USCS is described in Appendix C.

Representative soil samples were selected for testing to determine physical and engineering properties and to aid in classification. Following are the laboratory tests performed and a brief description of each test:

Natural Water Content: The percentage of water in the soil at the sample location.

Percent Passing No. 200 Sieve: Amount of combined clay- and silt-sized particles in the sample.

Atterberg Limits: Consistency and range of moisture content within which the material is workable.

Results of the laboratory tests are summarized on the boring logs in Appendix A and in the following sections of this report.

SITE CONDITIONS

The site consists of an undeveloped parcel northwest of the intersection of 3650 West and 13400 south. The topography of the site is gently sloping downwards to the east. A large excavation (possibly a detention pond) was observed several hundred feet northeast of the site. The surface of the site was covered with grass and weeds. Piles of fill were noted north of the site. The site is bordered to the north and east by undeveloped land, to the south by 13400 South, and to the west by a construction site. No standing water or existing structures were observed on the site.

SUBSURFACE CONDITIONS

Soil Conditions

Subsurface conditions encountered at the site are indicated on the boring logs in Appendix A. The stratification lines shown on the logs represent the approximate boundary between the soil types encountered; the actual transition may be gradual.

Soil conditions encountered onsite consisted of silty clay and clay-silt with a layer of silty sand and silt at depth. Silty clay was encountered below the silty sand and silt layer to the maximum depth explored of 21-½ feet below existing site grade.

The clay and clay-silt were generally very stiff to hard with N-values ranging between 13 and 45 blows per foot of penetration. Laboratory test results indicate that these soils have a liquid limit ranging between 25 to 37 percent, plasticity indices ranging between 6 and 18 percent and moisture contents ranging between 8 and 25 percent. Pinholes were observed in this soil in the upper 4 feet of the site.

The silt was generally very stiff with N-values ranging between 14 and 24 blows per foot of penetration. Laboratory test results indicate that these soils have moisture contents at about 10 percent.

The silty sand was generally medium dense with N-values ranging between 19 and 27 blows per foot of penetration. Laboratory test results indicate that these soils have a moisture content of approximately 6 percent and a fines content of approximately 19 percent.

Groundwater Conditions

The borings were monitored during drilling for the presence and level of groundwater. At the time of our field exploration, groundwater was not encountered within the depths explored. It should be recognized that fluctuations of the groundwater table may occur due to seasonal variations in the amount of rainfall, runoff, construction and other factors not evident at the time the borings were performed. Evaluation of these factors is beyond the scope of this exploration.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

Geotechnical Considerations

Based on the results of our exploration, it is our opinion that the site is suitable for the proposed construction provided the recommendations presented in this report are followed. The proposed building may be supported on lightly loaded continuous footings established on a minimum of 24 inches of properly placed and compacted structural fill as described below.

Pinholes were observed in near-surface soils encountered on this site. Pinholes are often associated with collapse potential in soil. This report provides recommendations to help reduce the potential for collapse below structures. However, even if these procedures are followed, the potential for some movement or minor cracking in the structure exists if subsurface soils become wetted. The potential for cracking and other damage will increase if any modification of the site results in excessive wetting of collapsible soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. We would be pleased to discuss other construction alternatives with you upon request.

Positive drainage away from the structure must be provided during construction and maintained throughout the life of the proposed project. Infiltration of water below structures should be prevented to reduce the potential for collapse. Special site grading and drainage recommendations are presented in this report to aid in controlling surface runoff. These special considerations should be discussed with the owner for planning purposes and made available to the contractor to minimize construction delays.

Foundation Systems

Lightly loaded conventional strip footings supported entirely on a minimum of 24 inches of properly placed and compacted structural fill may be proportioned for a maximum net allowable bearing pressure of 2,900 pounds per square foot (psf). The maximum allowable bearing pressure value applies to the total of dead load plus permanently and/or frequently applied live loads, and can be increased by 1/3 for short duration cyclic loads, such as wind or seismic.

If used, structural fill placed beneath foundations should extend laterally beyond the edges of the footings a distance equal to or greater than two-thirds of the structural fill thickness. Continuous and spot footings should have minimum dimensions of 16 inches and 30 inches, respectively. Exterior footing bottoms should be established a minimum of 30 inches below the lowest adjacent exterior grade for frost protection. Footings not subjected to frost should bear at least 12 inches below finished grade (proposed floor level).

Total settlements of footings are expected to be less than 1 inch for the recommended allowable bearing pressure. Differential settlement between similarly loaded footings is typically about 1/2 to 3/4 of the total settlement. Additional settlement should be anticipated if subsurface soils become wetted.

Lateral foundation loads may be resisted using the friction between the footing bottoms and underlying soil. Friction between the footing bottoms and underlying soil may be calculated using an ultimate friction coefficient of 0.4. A suitable factor of safety should be used against sliding.

If areas of loose or soft soil (unsuitable for bearing) are encountered in foundation excavations, the excavations should be extended deeper to suitable soils. The footings may then be extended to bear directly on these soils at the lower level or on properly compacted structural fill extending down to the suitable soils. The base of the foundation excavations should be free of water and loose soil prior to placing concrete. Soils at bearing level that become frozen, disturbed or saturated should be removed prior to placing concrete. Exposed footing excavations should be viewed by the geotechnical engineer.

Floor Slab Design and Construction

To provide uniform support for slabs placed on grade, we recommend that all slabs be placed on a minimum of 6 inches of crushed gravel underlain by undisturbed native soils or properly placed and compacted structural fill.

If moisture sensitive floor coverings or treatments are to be used in the structures, or if there are other concerns about moisture vapor transmission through concrete slabs, a vapor retarder should be considered. The building designer is usually in the best position to make final decisions regarding the use of a vapor retarder, its method of placement, and its position

relative to the base of the slab. We will be available at your request to discuss the advantages and disadvantages of various methods of vapor retarder placement and related slab design and construction recommendations.

Seismic Considerations

Based on the results of our exploration, the shallow subsurface soil profile is best represented by Site Class D according to the 2006 International Building Code (IBC). The spectral response accelerations for 0.2 second (S_s) and 1.0 second (S_1) periods for a 2% probability of exceedance (PE) in 50 years at the project site are presented below. A search of the National Seismic Hazard Map database indicates the following probabilistic peak horizontal ground acceleration (PGA) for a 2% probability of exceedance (PE) in 50 years at the project site.

Period	Acceleration
PGA	0.47g
0.2 sec SA	1.19g
1.0 sec SA	0.46g

The soil conditions encountered in the borings generally consisted of very stiff to hard clay and silt, and medium dense silty sand. According to our analysis, the potential of the silty sand liquefying, if saturated, is very low. Soils conditions deeper than 21-½ feet were not explored or assessed for liquefaction during this exploration. The site is located in an area designated on published liquefaction maps as having very low potential for liquefaction.

Pavements

The pavement section presented below was determined in general accordance with the 1993 AASHTO "Guide for the Design of Pavement Structures." Design traffic consisting of 10,000 ESALs was used for parking lots and 75,000 ESALs for loading docks and other higher truck traffic areas. A California Bearing Ratio (CBR) of 5 percent was assumed to represent the clay subgrade soil. The following pavement sections, or an approved equivalent, should be placed on the properly prepared subgrade soils as described below.

Traffic Area	Recommended Pavement Sections (Inches)				
	Asphalt Concrete Surfacing	Portland Cement Surfacing	Aggregate Base Course	Granular Subbase	Total
Parking Lots	3.0	—	6.0	—	9.0
	—	5.0	6.0	—	11.0
Truck Traffic Areas	4.0	—	9.0	—	13.0
	—	6.0	6.0	—	12.0

Paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course and underlying sub-grade. Permanent drainage should be incorporated into the pavement grading design.

The asphaltic concrete should be placed and compacted to at least 95 percent of the maximum density as determined by ASTM D 1559 (50 blows each end). Aggregates, granular subbase, and asphaltic concrete should conform to local city or Utah Department of Transportation (UDOT) specifications.

In areas of anticipated heavy load (i.e. trash dumpster pads) or concentrated loads, a Portland cement concrete section of at least 8 inches thick is recommended.

The pavement sections provided in this report are minimums for the given design criteria and as such, periodic maintenance should be expected. A maintenance program that includes surface sealing, joint cleaning and sealing, and timely repair of cracks and deteriorated areas will increase the pavement's service life. As an option, thicker sections could be constructed to decrease future maintenance.

Earthwork

Topsoil, existing fill, disturbed soils and other deleterious materials should be removed from beneath building and pavement areas. Excavations resulting from the removal of these materials should be backfilled with structural fill. Following removal of these materials, the exposed native soils should be proof-rolled to aid in assessing subgrade condition. Soft areas encountered during proof-rolling should be excavated and replaced with structural fill properly placed and compacted as described below.

The near-surface native soils encountered may be susceptible to disturbance or rutting under the weight of construction equipment if they become wet. In order to reduce the potential for disturbance or rutting, excessive water should not be applied to the surface during earthwork operations and construction should occur during dryer weather. Soils that become excessively rutted, are pumping or otherwise disturbed are unstable and not suitable for support of

structural loads, floor slabs or pavements, and should be removed and replaced with structural fill.

Positive drainage away from the structure must be provided during construction and maintained throughout the life of the proposed project. Infiltration of water into excavations should be prevented during construction. It is important that foundation soils are not allowed to become wetted. All grades must provide effective drainage away from the building during and after construction. Water permitted to pond next to the building can result in greater soil movements than those discussed in this report. These greater movements can result in unacceptable differential floor slab movements and cracked slabs and walls. Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained.

Exposed ground should be sloped at a minimum 5 percent away from the building for at least 10 feet beyond the perimeter of the building. After building construction and landscaping, we recommend verifying final grades to document that effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted as necessary, as part of the structure's maintenance program.

Roof runoff and surface drainage should be collected and discharged far away from the structure to prevent wetting of the foundation soils. Roof gutters should be installed and connected to downspouts and pipes directing roof runoff at least 10 feet away from the building.

Planters located within 10 feet of the structure should be self-contained to prevent water accessing the building and pavement subgrade soils. Sprinkler mains and spray heads should be located at least 5 feet away from the building. Landscaped irrigation should not be used near the building.

Structural fill beneath foundations or slabs should consist of well graded, granular soil with a maximum particle size of 3 inches, 25 to 60 percent passing the No. 4 sieve and having 30 to 50 percent fines. The recommended 6-inch thick layer of gravel beneath concrete slabs should be 3/4-inch minus crushed aggregate.

All fill should be approved by the geotechnical engineer, should be moisture conditioned to near optimum water content, placed in uniform lifts not exceeding 8 inches in loose thickness, and be compacted to the following minimum percentages of the maximum dry density as determined by ASTM D 1557 (Modified Proctor):

Location	Percent of Maximum Dry Density ASTM D 1557
Building areas	95
Pavement areas and other areas of fill and backfill	92

It is the responsibility of the contractor to provide safe working conditions in connection with underground excavations. Temporary construction excavations should be properly sloped or shored. All excavations should be accomplished in accordance with applicable federal, state, and local standards.

It is anticipated that the majority of the excavations for the proposed construction can be accomplished with conventional earth moving equipment.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of structural fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

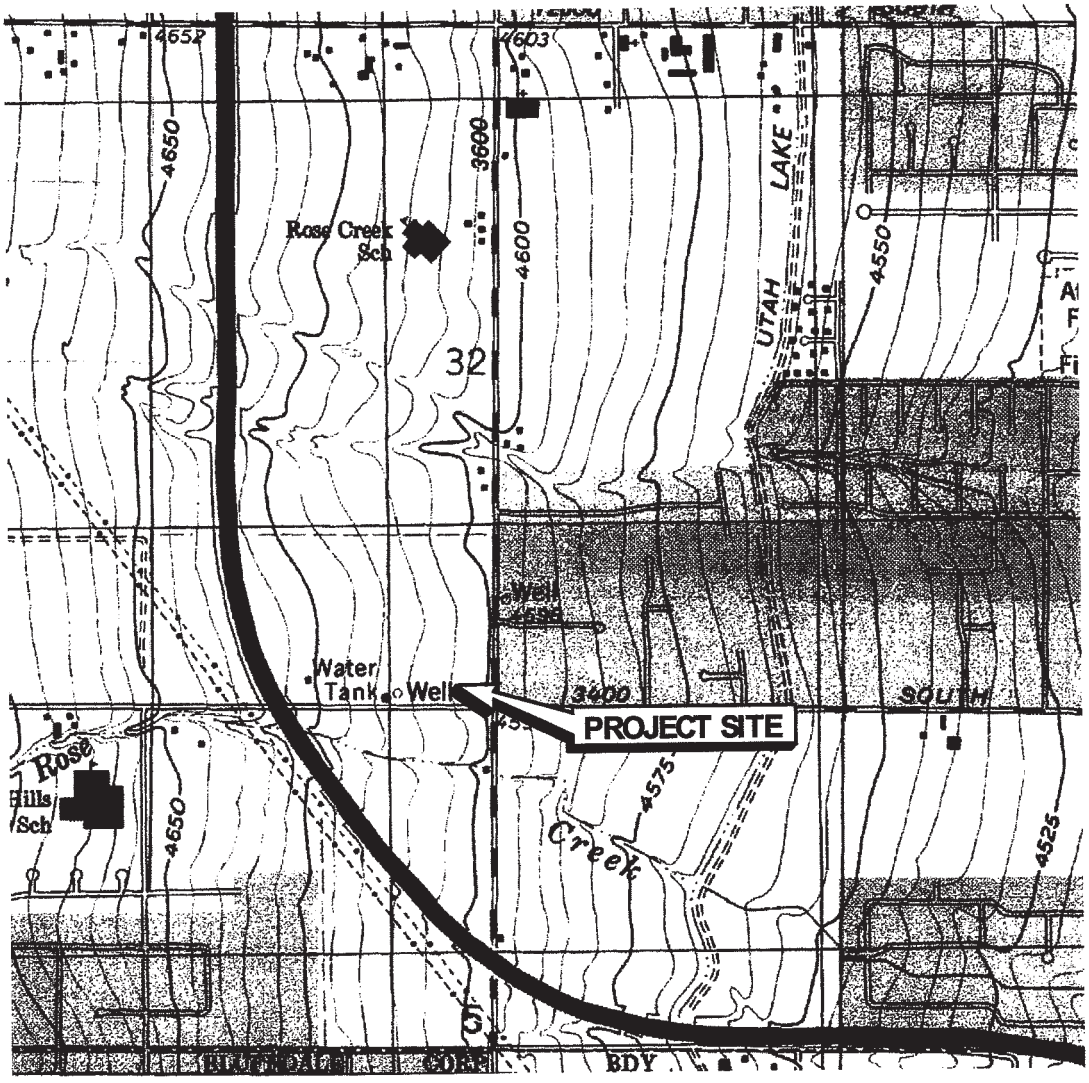
GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, expressed or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.



SCALE 1:24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

REFERENCE:
USGS 7.5-MINUTE QUADRANGLES FOR MIDVALE, UTAH

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

N

PROJECT VICINITY MAP
PANDA EXPRESS RIVERTON
3650 W. 13400 S.
RIVERTON, UTAH
PANDA RESTAURANT GROUP

Project Mngr:	RLC	Project No.	61075008
Designed By:	USGS	Scale:	1:24,000
Checked By:	JWG	Date:	2/21/2007
Approved By:	RLC	Drawn By:	ABS (61)
File Name:	N:\Projects\2007\61075008\61075008 Figure 1 Vicinity.doc	Figure No.	1

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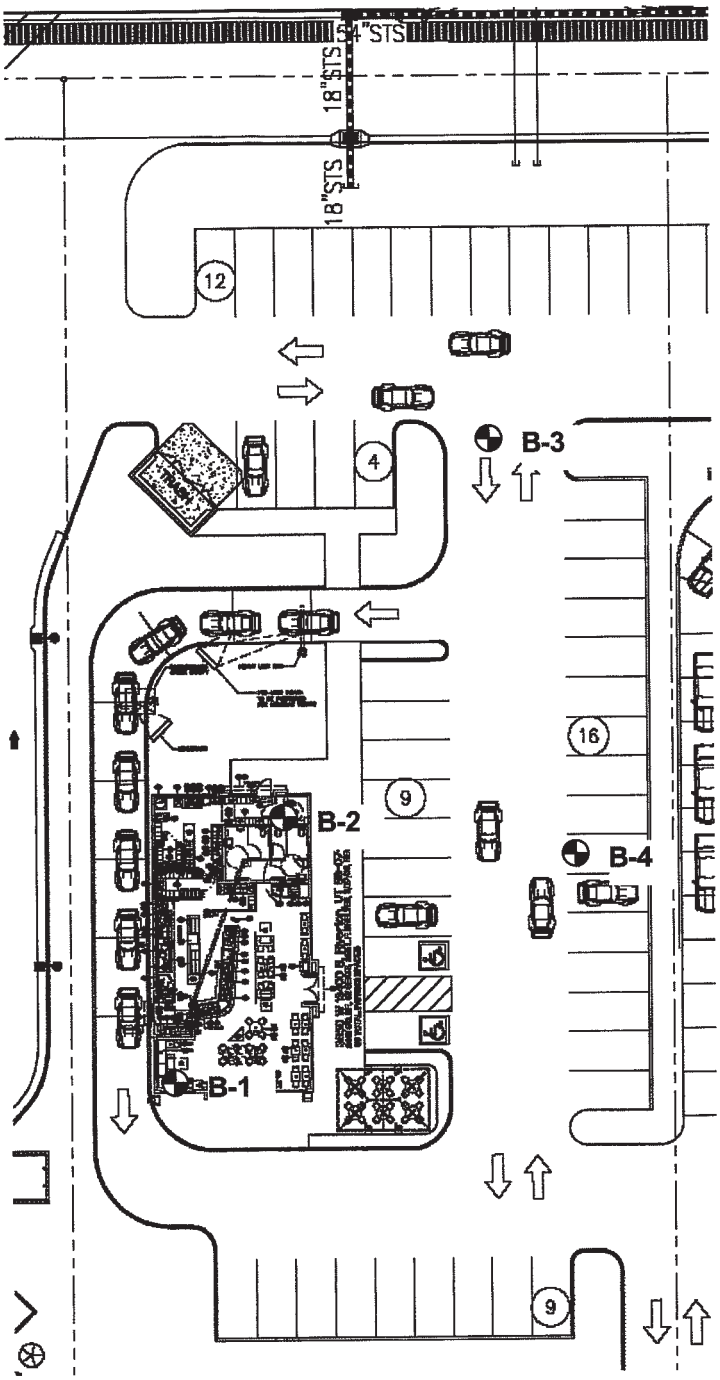


BORING LOCATION PLAN
PANDA EXPRESS RIVERTON
3650 W. 13400 S.
RIVERTON, UTAH
FOR PANDA RESTAURANT GROUP

Project Mngr:	RLC	Terracon	Project No. 61075008
Designed By:	JWG	12217 S. Lone Peak Pkwy. Ste. 100 Draper, Utah 84020 801.545.8500 Fax: 801.545.8600	Scale: NOT TO SCALE
Checked By:	JWG		Date: 2/21/07
Approved By:	RLC		Drawn By: JWG (61)
File Name:	N:\Projects\2007\61075008\8x 11 Word Portrait.doc		Figure No. 2

N

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

LOG OF BORING NO. B-01

CLIENT: **Panda Restaurant Group Inc.**

SITE: **Riverton, Utah**

PROJECT: **Panda Express Riverton**

GRAPHIC LOG	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: PENETRATION RESISTANCE BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WEIGHT, PCF	TESTS: LIQUID LIMIT	TESTS: PLASTICITY INDEX	TESTS: % PASSING NO. 200 SIEVE	OTHER
0.25 **TOPSOIL:** with grass and weeds **SILTY CLAY:** very stiff to hard, light brown with white streaking and orange mottling, pinholes in upper 4'	1											
	2											
	3		1	SS	18	20	10					
	4											
	5											
	6		2	SS	10	44						
	7											
	8	CL	3	SS	4	26	13		37	18		
9.5	9											
SILTY SAND: medium dense, brown to gray	10	SM	4	SS	14	19	6				19	
12	11											
SILT: very stiff, brown with orange mottling	12											
	13		5	SS	16	14						
14.5	14											
SILTY CLAY: very stiff, gray to brown with orange mottling	15											
	16		6	SS	14	13						
	17											
	18											
	19											
	20		7	SS	14	19						
21.5	21											
BOTTOM OF BORING AT APPROXIMATELY 21.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▽		▼
WL			

Terracon

BORING STARTED	2-7-07		
BORING COMPLETED	2-7-07		
RIG	B-80	FOREMAN	JWG
LOGGED	JWG	JOB #	61075008

BOREHOLE 99 61075008.GPJ TERRACON.GDT 2/21/07

LOG OF BORING NO. B-02

CLIENT: **Panda Restaurant Group Inc.**

SITE: **Riverton, Utah**

PROJECT: **Panda Express Riverton**

GRAPHIC LOG	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: PENETRATION RESISTANCE BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WEIGHT, PCF	TESTS: LIQUID LIMIT	TESTS: PLASTICITY INDEX	TESTS: % PASSING NO. 200 SIEVE	OTHER
0.25 **TOPSOIL:** with grass and weeds **CLAY-SILT:** very stiff to hard, light brown to white with orange mottling, pinholes in upper 4'	1											
	2											
	3	CL ML	1	SS	14	17	8		25	6		
	4											
	5		2	SS	8	34						
	6											
	7											
	8		3	SS	12	34	8					
9.5 **SILTY SAND:** medium dense, light brown	9											
	10		4	SS	12	27						
12 **SILT:** very stiff, light brown	11											
	12											
	13		5	SS	14	24						
	14											
	15		6	SS	12	24	10					
18 **SILTY CLAY:** very stiff, brown	16											
	17											
	18											
	19											
	20		7	SS	12	25						
21.5 BOTTOM OF BORING AT APPROXIMATELY 21.5 FEET	21											

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▼
WL	▼		▼
WL			

Terracon

BORING STARTED	2-7-07		
BORING COMPLETED	2-7-07		
RIG	B-80	FOREMAN	JWG
LOGGED	JWG	JOB #	61075008

BOREHOLE 99 61075008.GPJ TERRACON.GDT 2/21/07

LOG OF BORING NO. B-03

CLIENT: **Panda Restaurant Group Inc.**

SITE: **Riverton, Utah**

PROJECT: **Panda Express Riverton**

GRAPHIC LOG	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: PENETRATION RESISTANCE BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WEIGHT, PCF	TESTS: LIQUID LIMIT	TESTS: PLASTICITY INDEX	TESTS: % PASSING NO. 200 SIEVE	OTHER
0.25 **TOPSOIL:** with grass and weeds **SILTY CLAY:** with fine to coarse sand, very stiff to hard, light brown to dark brown with some white, pinholes in upper 4'	1											
	2											
	3	CL	1	SS	18	20	15		29	15		
	4											
	5		2	SS	14	28						
6.5	6											
BOTTOM OF BORING AT APPROXIMATELY 6.5 FEET												

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ NE	WD	▽
WL	▽		▽
WL			

Terracon

BORING STARTED	2-7-07		
BORING COMPLETED	2-7-07		
RIG	B-80	FOREMAN	JWG
LOGGED	JWG	JOB #	61075008

BOREHOLE 99 61075008.GPJ TERRACON.GDT 2/21/07

LOG OF BORING NO. B-04

CLIENT: **Panda Restaurant Group Inc.**

SITE: **Riverton, Utah**

PROJECT: **Panda Express Riverton**

GRAPHIC LOG	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: PENETRATION RESISTANCE BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WEIGHT, PCF	TESTS: LIQUID LIMIT	TESTS: PLASTICITY INDEX	TESTS: % PASSING NO. 200 SIEVE	OTHER
0.25 **TOPSOIL:** with grass and weeds **SILTY CLAY:** very stiff to hard, brown with white stain, pinholes in upper 4'	1											
	2											
	3		1	SS	14	19	13					
	4											
	5		2	SS	10	45						
6.5 BOTTOM OF BORING AT APPROXIMATELY 6.5 FEET	6											

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft

'L	▽ NE	WD	▼
	▼		▼

Terracon

BORING STARTED	2-7-07		
BORING COMPLETED	2-7-07		
RIG	B-80	FOREMAN	JWG
LOGGED	JWG	JOB #	61075008

TERRACON.GDT 2/21/07

APPENDIX B

GENERAL NOTES
UNIFIED CLASSIFICATION SYSTEM

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube - 3" O.D., unless otherwise noted	PA:	Power Auger
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB:	Wash Boring or Mud Rotary

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration"or "N-value".

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	WS:	While Sampling	N/E:	Not Encountered
WCI:	Wet Cave in	WD:	While Drilling		
DCI:	Dry Cave in	BCR:	Before Casing Removal		
AB:	After Boring	ACR:	After Casing Removal		

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	<2	Very Soft
500 – 1,000	2-3	Soft
1,001 – 2,000	4-6	Medium Stiff
2,001 – 4,000	7-12	Stiff
4,001 – 8,000	13-26	Very Stiff
8,000+	26+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	Ring Sampler (RS) Blows/Ft.	Relative Density
0 – 3	0-6	Very Loose
4 – 9	7-18	Loose
10 – 29	19-58	Medium Dense
30 – 49	59-98	Dense
50+	99+	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 – 12
Modifiers	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1-10
Medium	11-30
High	30+

Terracon

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification	
					Group Symbol	Group Name[B]
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]		GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]		GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]		SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]		SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH		SM	Silty sand[G,H,I]
			Fines Classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		organic	Liquid limit - oven dried	< 0.75	OL	Organic clay[K,L,M,N]
			Liquid limit - not dried			Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
			PI lots below "A" line		MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried	< 0.75	OH	Organic clay[K,L,M,P]
			Liquid limit - not dried			Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

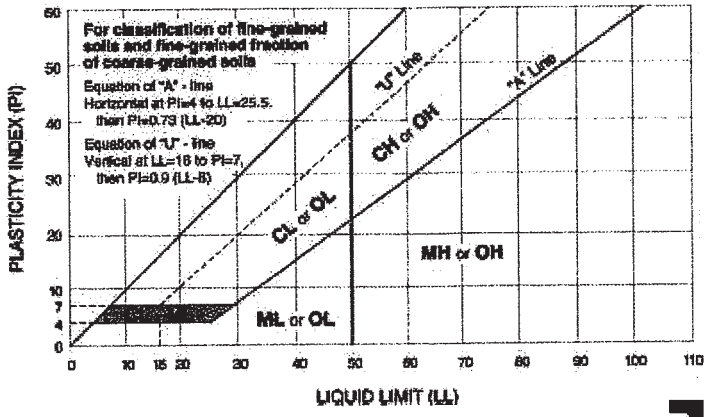
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Ronald A. Roberts Associates, Inc.
Consulting Engineers

STRUCTURAL DESIGN CALCULATIONS

PROJECT: PANDA EXPRESS

LOCATION: RIVERTON, UTAH

BUILDING CODE: 2006 INTERNATIONAL BUILDING CODE

DESIGN LOADS

90 MPH WIND LOAD
30 PSF ROOF LIVE LOAD
(30 PSF GROUND SNOW LOAD)
20 PSF ROOF DEAD LOAD

DATE: MAY 23, 2007

REGISTERED PROFESSIONAL ENGINEER
No. 363570
RONALD A. ROBERTS
STATE OF UTAH
3/14/08

1 CITY COMMENTS 03/06/08

1420 West Mockingbird Lane ▪ Suite 540 ▪ Dallas, TX 75247 ▪ Phone: 214/637-6299 ▪ Fax: 214/637-6997

Ronald Roberts Associates, Inc.
Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Design Loads DATE _____

BY: C.P CK: _____ SHT: _____ OF _____

Roof Dead Load (Per ASCE 7 table C3-1):

Roof Deck (3/4" plywood)	= 2.4 psf
Insulation (3" rigid)	= 4.5 psf
Roofing (Bituminous)	= 1.5 psf
Joists (per TJ manual, TJS ≈ 5.0 psf)	= 5.0 psf
Misc HVAC	= 4.0 psf
Ceiling, Lighting, etc.	= 2.6 psf
	20 psf

FOR RUSTY

Live Load = 30 psf

Ronald A. Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Design Loads DATE

BY: C.P. CK: SHT: OF

Wind Load : per 2006 IBC

Wind speed : 90 mph

Exposure : C

Use Simplified Wind Load Method (ASCE 7-05) :

$p_s = \lambda K_{zt} I p_{s30}$

$\lambda = 1.29$ (Fig. 6-2 ASCE 7-05 p40) $H = 20$ ft

$K_{zt} = 1.0$ (ASCE 7-05 section 6.5.7 p26)

$I = 1.0$ (table 6-1 ASCE 7-05 p.77)

$p_{s30} = 12.8$ psf (Roof angle 0 to 5° - fig 6-2 p38 ASCE 7-05)

$p_s = (1.29)(1.0)(1.0)(12.8) =$ 16.5 psf (Horizontal)

For $H = 25$ ft (towers)

$\lambda = 1.35$

$p_s = 1.35(1.0)(1.0)(12.8) =$ 17.3 psf (Horizontal - tower)

Uplift on roof elements

$p_{net} = \lambda K_{zt} I p_{net30}$

$\lambda = 1.21$ (Fig. 6-3 ASCE 7-05 p44) $H = 14$ ft

$K_{zt} = 1.0$

$I = 1.00$

$p_{net30} = 15.8$ psf (Zone 3; Effective area = 100 sf) fig. 6-3 p42

$p_{net} = (1.21)(1.0)(1.0)(15.8) = 19.11$ psf (Vertical gross)

Net wind load = 19.11 psf - (20/2) = 9.11 psf (vertical) (net, components and cladding)

SNOW DRIFT CALCUATIONS

USE ASCE 7-05 EQUATIONS

Hd = 0.43 x 1/3ROOT(Wb) x 1/4ROOT(Pg + 10) - 1.5

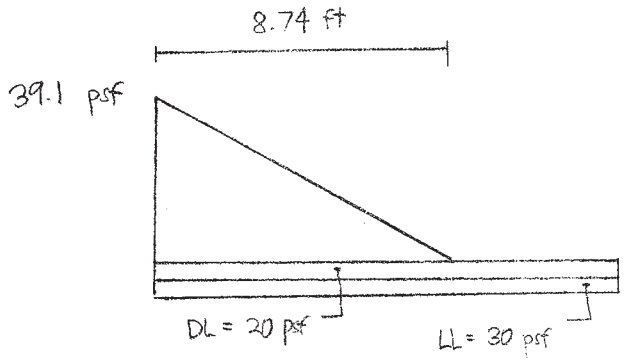
Wb =	68	FT
Pg =	45	PSF
	43	PSF
	35	PSF
	31.5	PSF
	30	PSF
	25	PSF
	21	PSF
	20	PSF
	15	PSF

0.75 x Hd			
	2.46	FT	(45 PSF)
	2.43	FT	(43 PSF)
	2.28	FT	(35 PSF)
	2.22	FT	(31.5 PSF)
	2.19	FT	(30 PSF)
	2.08	FT	(25 PSF)
	1.98	FT	(21 PSF)
	1.96	FT	(20 PSF)
	1.82	FT	(15 PSF)

Wd = 4 x (0.75 x Hd)			
	9.84	FT	(45 PSF)
	9.71	FT	(43 PSF)
	9.14	FT	(35 PSF)
	8.86	FT	(31.5 PSF)
	8.74	FT	(30 PSF)
	8.31	FT	(25 PSF)
	7.92	FT	(21 PSF)
	7.82	FT	(20 PSF)
	7.27	FT	(15 PSF)

D = 0.13 x Pg + 14.0			
	19.9	PCF	(45 PSF)
	19.6	PCF	(43 PSF)
	18.6	PCF	(35 PSF)
	18.1	PCF	(31.5 PSF)
	17.9	PCF	(30 PSF)
	17.3	PCF	(25 PSF)
	16.7	PCF	(21 PSF)
	16.6	PCF	(20 PSF)
	16.0	PCF	(15 PSF)

Pd = (0.75 x Hd) x D			
	48.8	PSF	(45 PSF)
	47.5	PSF	(43 PSF)
	42.4	PSF	(35 PSF)
	40.1	PSF	(31.5 PSF)
	39.1	PSF	(30 PSF)
	35.8	PSF	(25 PSF)
	33.1	PSF	(21 PSF)
	32.5	PSF	(20 PSF)
	29.0	PSF	(15 PSF)



Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Design Values / Equations DATE 1/13/04

BY: YBJ CK: SHT: OF

- Glulam Beams: (Lesser of 24F-V8 DFL or 24F-V4 SP)
  - F_b = 2400 psi
  - F_v = 190 psi
  - E = 1,700,000 psi

- 2x - 4x Lumber: (Lesser of #2 DFL or #2 SP)
  - F_b = 900 psi
  - F_v = 90 psi
  - F_c = 1350 psi
  - E = 1,600,000 psi
  - F_t = 550 psi
  - $F_{c\perp}$ = 565 psi

- 5x and larger: (Lesser of #1 DFL or #1 SP)
  - F_b = 1200 psi
  - F_v = 85 psi
  - F_c = 825 psi
  - E = 1,500,000 psi
  - F_t = 675 psi
  - $F_{c\perp}$ = 375 psi

- PSL Columns
  - F_b = 2400 psi
  - $F_{c\parallel}$ = 2500 psi
  - E = 1,800,000 psi

- $A_{reqd} = \frac{V_{max}(1.5)}{F_v'}$

- $S_{reqd} = \frac{M_{max}(12)}{F_b'}$

- $I_{reqd} = \frac{w(240)(5)[L\cdot 12]^3}{12(384)\cdot E}$ (simple support, uniform load, $\Delta_{max} = L/240$)

- $V_{max} = \frac{wL}{2}$

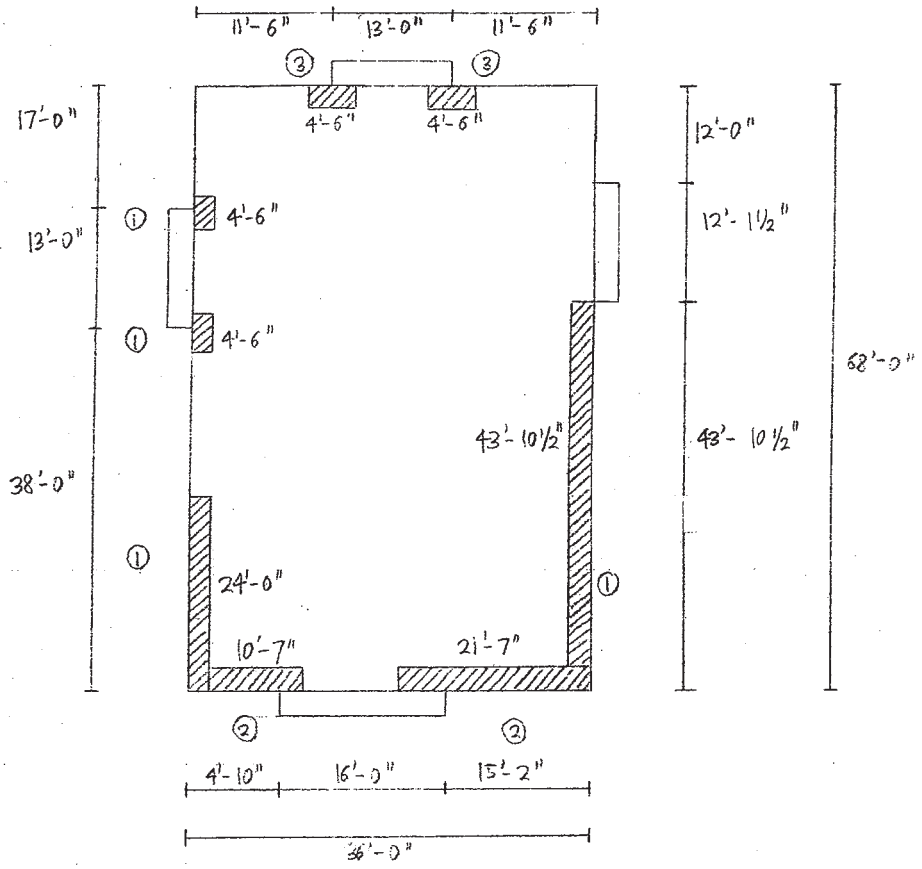
- $M_{max} = \frac{wL^2}{8}$

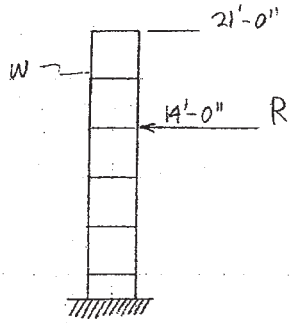
Ronald A. Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Shearwall Design DATE

BY: C.P. CK: SHT: OF





W = 16.5 psf @ main Bldg.

For main building:

Height to deck = 14'-0"

$$R = 16.5\left[\left(\frac{14}{2}\right) + (21 - 14)\right] = 231 \text{ plf}$$

For tower:

W = 17.3 psf Height = 23 ft

$R_{tower} = 17.3(23 - 21) = 35$ plf Additional load

cont'd. ⟶

Ronald A. Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Seismic design DATE

BY: C.P CK: SHT: OF

Per 2006 IBC

Simplified Analysis Procedure for seismic Design of buildings.

S_S = 1.136

S_1 = 0.467

Site class D

$S_{MS} = F_a S_S$ (eqn. 11.4-1 ASCE 7 p115)

$S_{M1} = F_v S_1$ (eqn. 11.4-2 ASCE 7 p115)

where

F_a = 1.0 (table 11.4-1 ASCE 7 p115)

F_v = 1.6 (table 11.4-2 ASCE 7 p.115)

S_{MS} = 1.0 (1.136) = 1.136

S_{M1} = 1.6 (0.467) = 0.747

$S_{DS} = \frac{2}{3} F_a S_S$ (eqn. 12.14-11 ASCE 7 p141)

$S_{DS} = \frac{2}{3} (1.0)(1.136) = 0.757$

$S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} (0.747) = 0.498$

Occupancy category II (table 1-1 ASCE 7 p3)

Importance factor, I = 1.0 (table 11.5-1 ASCE 7 p116)

Seismic design category: D (table 11.6-1, 11.6-2 ASCE 7 p116)

Seismic base shear:

$V = \frac{F S_{DS}}{R} \cdot W$ (eq. 12.14-11 ASCE 7 p 141)

where F = 1.0 & R = 6.5 (table 12.14-1 ASCE 7, p 135)

Project Name = Riverton, Utah
Conterminous 48 States
2006 International Building Code
Zip Code = 84065
Spectral Response Accelerations Ss and S1
Ss and S1 = Mapped Spectral Acceleration Values
Site Class B - Fa = 1.0 ,Fv = 1.0
Data are based on a 0.01 deg grid spacing

Period (sec)	Centroid Sa (g)	
0.2	1.136	Ss, Site Class B
1.0	0.467	S1, Site Class B

Period (sec)	Maximum Sa (g)	
0.2	1.368	Ss, Site Class B
1.0	0.575	S1, Site Class B

Period (sec)	Minimum Sa (g)	
0.2	0.783	Ss, Site Class B
1.0	0.295	S1, Site Class B

Conterminous 48 States
2006 International Building Code
Zip Code = 84065
Spectral Response Accelerations SMs and SM1
SMs = FaSs and SM1 = FvS1
Site Class D - Fa = 1.045 ,Fv = 1.533

Period (sec)	Sa (g)	
0.2	1.188	SMs, Site Class D
1.0	0.717	SM1, Site Class D

Conterminous 48 States
2006 International Building Code
Zip Code = 84065
SDs = 2/3 x SMs and SD1 = 2/3 x SM1
Site Class D - Fa = 1.045 ,Fv = 1.533

Period (sec)	Sa (g)	
0.2	0.792	SDs, Site Class D
1.0	0.478	SD1, Site Class D

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Seismic design DATE

BY: CP CK: SHT: OF

Design loads:

Roof dead = 20 psf

Exterior / Interior walls = 15 psf

Mechanical weight = 6,738 lbs

Exterior walls:-

perimeter

(height = 23'-0") P = 17' + 19' = 36'

(h = 21'-0") P = 18' + 14.125 = 32.125'

(h = 19'-0") P = 54' + 20' + 52' + 22' = 148'

B.O. Deck = 14'-0"

15 psf $\left[\left(\frac{14'}{2}\right) + (23 - 14)\right]$ (36') = 8,640 lbs

15 psf $\left[\left(\frac{14}{2}\right) + (21 - 14)\right]$ (32.125) = 6,747 lbs

15 psf $\left[\left(\frac{14}{2}\right) + (19 - 14)\right]$ (148') = 26,640 lbs

Total weight = 8640 + 6747 + 26,640 = 42,027 lbs

Interior walls:-

Perimeter = 101 ft (h = 14'-0")

(15 psf)(101 ft)(14/2) = 10,605 lbs

Roof dead load:-

(20 psf)(68 x 36) = 48,960 lbs

cont'd →

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Seismic design DATE

BY: C.P. CK: SHT: OF

Mech. equipment.-

Total = 6,738 lbs

Total load = 42,027 lbs + 10,605 lbs + 48,960 lbs + 6,738 lbs = 108,330 lbs

Direction North - South :

$V = \frac{1.0\ (0.757)}{6.5} (108,330\ lbs) = 12,617\ lbs$

$\frac{12617\ lbs}{36\ ft} = 351\ plf$ ∴ Seismic controls

Direction East - West:

$\frac{12617\ lbs}{68\ ft} = 186\ plf$ ∴ wind controls

Distribution of tower load to shearwalls:

Transverse direction:-

Load to wall ②: $\frac{68-49.9}{68}(12.125)(35) + \frac{68-44.5}{68}(13)(35) + 5(35) = 446$ lbs

Load to wall ③: $\frac{49.9}{68}(12.125)(35) + \frac{44.5}{68}(13)(35) + 7(35) = 855$ lbs

Longitudinal direction:-

Load to wall ①: $\frac{36-12.83}{36}(16)(35) + \frac{36-18}{36}(13)(35) + 5(35) = 763$ lbs ✓ worst case

$= \frac{12.83}{36}(16)(35) + \frac{18}{36}(13)(35) + 5(35) = 602$ lbs

Total Load to Shearwalls:-

Wall ①: $\frac{36}{2}(351) = 6,318$ lbs

Wall ②: $\frac{68}{2}(231) + 446 = 8,300$ lbs

Wall ③: $\frac{68}{2}(231) + 855 = 8,709$ lbs

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Shearwall Design DATE

BY: CP CK: SHT: OF

Wall ①: V= 6,318 lbs

Nailing length: L_N = 33'-0" Anchor Length, L_A = 32'-0"

Height = 14'-0"

Nailing = $\frac{V}{L_N} = \frac{6,318}{33} = 192$ plf

Use 8d @ 6" o.c.

15/32" CDX allow = 260 plf

Anchors = $\frac{VH}{L_A} = \frac{(6318)(14)}{32} = 2,764$ lbs

Use HD5A or PHD2

allow = 4,010 lbs

Wall ②: V= 8,300 lbs

L_N = 32'-2" L_A = 31'-2"

* wind controls walls 2 & 3. Per code section 2306.4.1. shear capacities can be increased 40%.

Height = 14'-0"

Nailing = $\frac{8,300}{32.17} = 258$ plf

Use 8d @ 6" o.c.

15/32" CDX allow = 260 plf x 1.4 = 364 plf *

Anchors = $\frac{8300(14)}{31.17} = 3728$ lbs

Use HD5A

allow = 4010 lbs

Wall ③: V= 8,709 lbs

L_N = 9'-0" L_A = 8'-0"

Height = 14'-0"

Nailing = $\frac{8,709}{9} = 968$ plf

Use 8d @ 4" o.c. e.f.

allow = 380 (2) = 760 plf x 1.4 = 1064 plf *

Anchors = $\frac{8709(14)}{8} = 15,241$ lbs

Use HD15

allow = 16,345 lbs

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Diaphragm design DATE _____

BY: C.P. CK: _____ SHT: _____ OF _____

Diaphragm nailing: (Blocked diaphragm) 10d nails

Wall ①: $\frac{6,318}{68}$ = 93 plf (case 3) BN = 6" o.c. EN = 6" o.c. (allow = 320 plf)

Wall ②: $\frac{8,300}{36}$ = 231 plf (case 1) BN = 6" o.c. EN = 6" o.c. (allow = 320 plf)

Wall ③: $\frac{8,709}{36}$ = 242 plf (case 1) BN = 6" o.c. EN = 6" o.c. (allow = 320 plf)

Exterior Stud Wall

Actual height = 14'-2" − 3 5/8" joist seat depth (TJI) + 3" = 13'-7 3/8" (det. 4/S4)

Height = 13'-7 3/8" Spacing = 16" O.C.

Stud Size = 2-2x6 Trib. Width = 18"-0"

$P = (20+30+39.1)(18.0)(16/12) = 2139$ LBS (DL+LL)

$w = 16.5(16/12) = 22$ plf (Wind Load)

$$\left[\frac{f_c}{F_c'}\right]^2 + \frac{f_b}{F_b'\left[1-(f_c/F_{cE})\right]} \leq 1.0 \quad \text{(NDS 3.9.2)}$$

$f_c = P/A = 2139/(8.25)(2) = 130$ psi

$F_c' = 1688 C_p$

$$F_{cE} = \frac{K_{cE} E}{(l_e/d)^2} = \frac{0.3(1.6\times10^6)}{[(13.61)(12)/5.5]^2} = 544 \text{ psi} \qquad \frac{F_{cE}}{F_c^*} = \frac{544}{1688} = 0.322$$

$$C_p = \frac{1+0.322}{2(0.8)} - \sqrt{\left(\frac{1+0.322}{2(0.8)}\right)^2 - \frac{0.322}{0.8}} = 0.296$$

$F_c' = 1688(0.296) = 500$ psi $>$ 130 psi ∴ O.K. For Comp.

$f_b = M/S \Rightarrow M = \frac{22(13.61)^2}{8} = 510$ Ft-#

$f_b = \frac{510(12)}{7.563(2)} = 405$ psi

809

$F_b' = 900(1.6)(1.15) = 1656$ psi $>$ 405 psi ∴ O.K. For Bend.

$$\left(130/500\right)^2 + \frac{405}{1656\left[1-(130/544)\right]} = 0.388 < 1.0 \text{ O.K. Fa Comb.}$$

Use 2-2x6 @ 16" O.C.

Chord design:

Front & backwall:

$M = \frac{PL}{8} = \frac{6318(2)(36)}{8} = 56.8$ ft·k

Chord force (Tension + Compression) $= \frac{56.8}{68} = 0.83$ k

Use 2 - MST148 strap (allow = 4350 lbs x 2 = 8700 lbs)

check ledger: 2x10

$F_T = 550(13.88) = 7.6$ k > 0.83k ∴ o.k. Use 2x10 ledger

Side walls:

$M = \frac{PL}{8} = \frac{(8300 + 8709)(68)}{8} = 145$ ft·k

Chord force (tension + compression) $= \frac{145}{36} = 4.0$ K

Use CMST16 strap (allow = 4585 lbs)

Check double top plate: 2 - 2X6

$F_T = (550)(5.25)(2) = 5.7$ k > 4.0K ∴ o.k. Use 2- 2x6 top plate

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Joist design DATE _____

BY: CP CK: _____ SHT: _____ OF _____

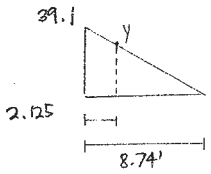
1st. Joist from south.

Span = 36'-0"

DL = 20 psf

LL = 30 psf

Parallel snow drift = 29.6 psf from 0' to 15'-2"



$\frac{39.1}{8.74} = \frac{y}{6.615}$ $y = 29.6$ psf

Tapered snow drift = 39.1 psf to 29.6 psf from 0' to 2'-1½"

29.6 psf to 39.1 psf from 13'-0½" to 15'-2"

Point load (parapet wall):

Parapet height = 20'-10"; b.o. trusses = 11'-6" 11'-6" + 26" = 13'-8" (b.o. deck)

wall h = 20'-10" - 13'-8" = 7'-2"

w_2 = (15 psf)(7.167') = 108 plf

P = (108 plf)(1.625') = 175.5 lbs

+ (150 psf)(8")(1.625') = 54 lbs

P = 175.5 lbs + 54 lbs = 229.5 lbs @ 15'-4" and 31'-0"

- Drift = 39.1 psf from 31'-2" to 36'-0".

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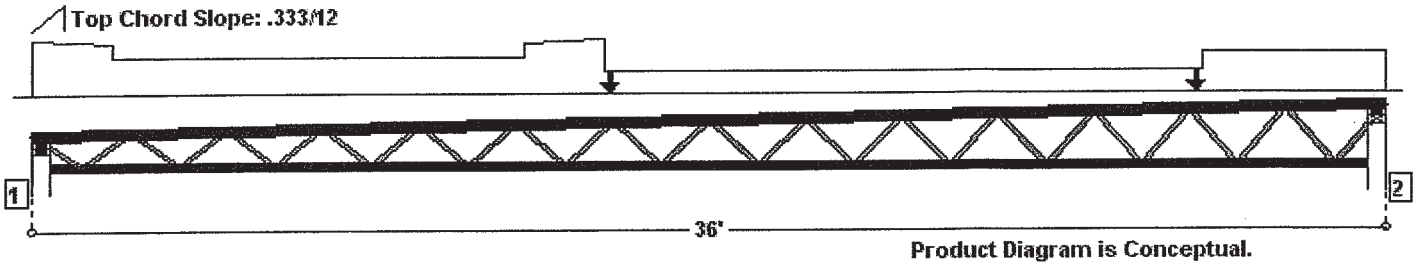
1st Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(psf)	Roof(1.25)	29.6	0.0	0 To 15' 2"	Adds To	Parallel snow drift
Tapered(psf)	Roof(1.25)	39.1 To 29.6	0.0 To 0.0	0 To 2' 1 1/2"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	29.6 To 39.1	0.0 To 0.0	13' 1/2" To 15' 2"	Adds To	Tapered drift
Point(lbs)	Roof(1.25)	0	230	15' 4"	-	Parapet
Point(lbs)	Roof(1.25)	0	230	31'	-	Parapet
Uniform(psf)	Roof(1.25)	39.1	0.0	31' 2" To 36'	Adds To	Snow drift

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	2732 / 1122 / 0 / 3854
2	Stud wall	5.50"	2238 / 1259 / 0 / 3497

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (89%)	Left Support
Web Controls		N/A	N/A	Passed (89.8%)	Web 2, Compression
Pin Controls		N/A	N/A	Passed (100%)	Hankinsons Control, Pin 11, Bottom
Chord Controls		N/A	N/A	Passed (95.9%)	Combined Loading, Tension, Pin 6, Bottom
Live Load Defl (in)		0.860	1.752	Passed (L/489)	MID Span 1 under Roof loading
Total Load Defl (in)		1.324	2.336	Passed (L/317)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

Carmen Parra, E.I.T.
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1st Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.

-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.

-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.

-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.

-Pricing Load (plf) = 204

-Beveled plate required at left support

-Beveled plate required at right support

-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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PROJECT: Panda Express JOB NO. _____

SUBJECT: Joist design DATE _____

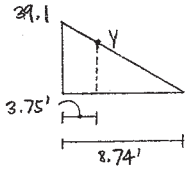
BY: CP CK: _____ SHT: _____ OF _____

2nd. Joist from south:

Span = 36'-0" trib. width = 1'-8"

DL = 20 psf
LL = 30 psf
} W_1

- Drift = 39.1 psf from 31'-2" to 36'-0"
- Parallel drift : 22.3 psf from 0' to 15'-2"



$\frac{39.1}{8.74} = \frac{y}{4.99}$ $y = 22.3$ psf

- Tapered drift : 39.1 psf to 22.3 psf from 0' to 3'-9"

  22.3 psf to 39.1 psf from 11'-5" to 15'-2"

- Parapet wall :-

parapet H = 20'-10" ; b.o. trusses = 11'-6" ; 11'-6" + 26" (avg. truss depth) = 13'-8" b.o. deck

wall H = 20'-10" - 13'-8" = 7'-2"

W_2 = (15 psf)(7.167') = 108 plf from 15'-2" to 31'-2"

- Roof (DL + LL)

W_3 = (50 psf)(2.083') = 104 plf from 15'-2" to 31'-2" (1/2 tower width 4'-2"/2)

- Point loads.-

Parapet :-

P_1 = (108 plf)(10"/12) = 90 lbs

(50 psf)(8")(10") = 28 lbs

P_1 = 90 + 28 = 118 lbs @ 15'-2" and 31'-2"

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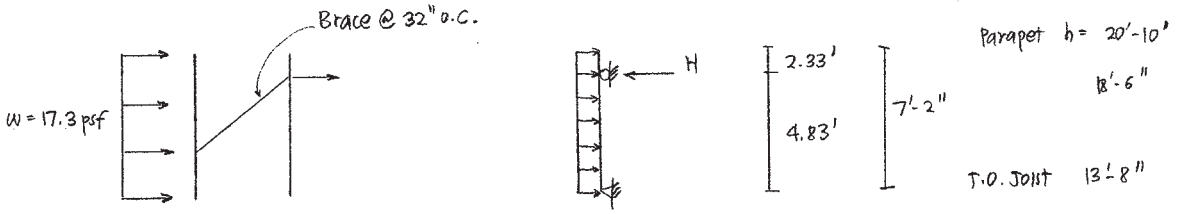
PROJECT: Panda Express JOB NO. _____

SUBJECT: Joist design DATE _____

BY: CP CK: _____ SHT: _____ OF _____

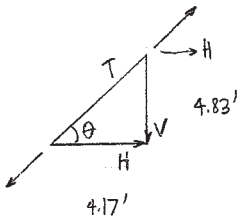
P_2 = wind from tower



For 1'-0" width of parapet

$w = 17.3\ psf\ (1.0') = 17.3\ plf$

$H = \frac{w}{2l}(l+a)^2 = \frac{17.3\ plf}{2(4.83')}(7.167')^2 = 92\ lbs$ (per foot of wall)



$\tan\theta = \frac{4.83}{4.17}$ $\theta = 49°$

$\tan 49° = \frac{V}{H}$

$V = 92\ lbs \tan 49 = 106\ lbs$ (per foot of wall)

$P = (106\ lbs)(1.33') = 141\ lbs$

Header reactions:-

1410 lbs @ 28'-3"

215 lbs @ 31'-1"

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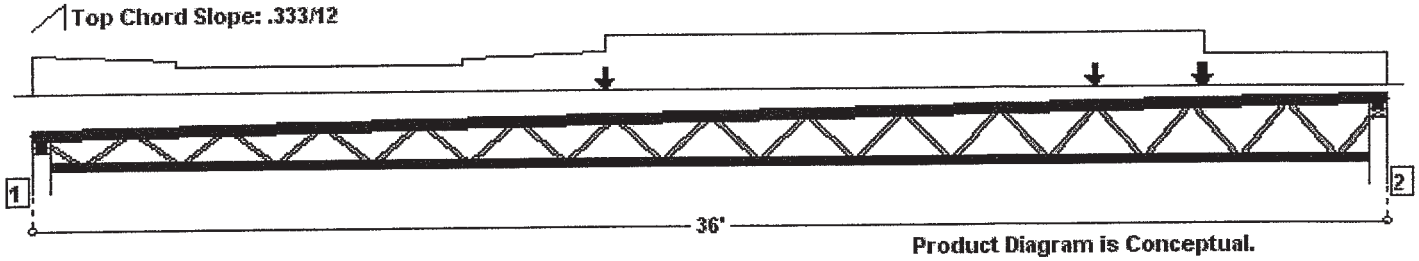
2nd Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 16" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(psf)	Roof(1.25)	39.1	0.0	31' 2" To 36'	Adds To	Drift along tower
Uniform(psf)	Roof(1.25)	22.3	0.0	0 To 15' 2"	Adds To	Parallel Drift
Tapered(psf)	Roof(1.25)	39.1 To 22.3	0.0 To 0.0	0 To 3' 9"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	22.3 To 39.1	0.0 To 0.0	11' 5" To 15' 2"	Adds To	Tapered drift
Uniform(plf)	Roof(1.25)	54.0	0.0	15' 2" To 31' 2"	Adds To	Parapet wall load ✓
Uniform(plf)	Roof(1.25)	52.0	0.0	15' 2" To 31' 2"	Adds To	Roof (DL+LL) ✓
Point(lbs)	Roof(1.25)	0	59	15' 2"	-	Parapet
Point(lbs)	Roof(1.25)	0	59	31' 2"	-	Parapet
Point(lbs)	Roof(1.25)	0	71	15' 2"	-	Wind from tower
Point(lbs)	Roof(1.25)	0	71	15' 2"	-	Wind from tower
Point(lbs)	Roof(1.25)	0	705	28' 3"	-	Header reaction
Point(lbs)	Roof(1.25)	0	108	31' 1"	-	Header reaction

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	1935 / 764 / 0 / 2699
2	Stud wall	5.50"	2210 / 1270 / 0 / 3480

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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2nd Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 16" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (80.4%)	Right Support
Web Controls		N/A	N/A	Passed (94.3%)	Web 23, Compression
Pin Controls		N/A	N/A	Passed (93.4%)	Hankinsons Control, Pin 10, Top
Chord Controls		N/A	N/A	Passed (80.8%)	Combined Loading, Tension, Pin 7, Bottom
Live Load Defl (in)		0.835	1.752	Passed (L/504)	MID Span 1 under Roof loading
Total Load Defl (in)		1.216	2.336	Passed (L/345)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 1" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.
-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.
-Pricing Load (plf) = 172
-Beveled plate required at left support
-Beveled plate required at right support
-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Joist design DATE

BY: CP CK: SHT: OF

8th. Joist from south.

Span = 36'-0"

trib. width = 32"

DL = 20 psf

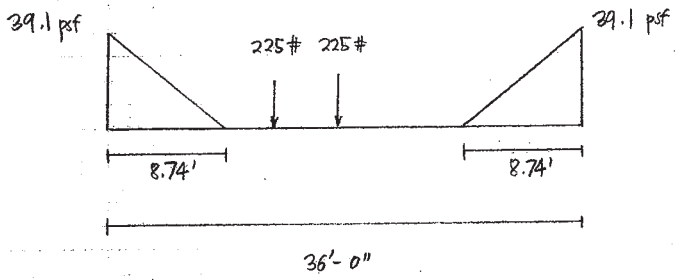
LL = 30 psf

Drift = 39.1 psf

Point loads:

225 lbs @ 14'-0"

225 lbs @ 17'-8"



Tapered drift = 39.1 psf to 0 psf from 0 to 8.74'

0 psf to 39.1 psf from 27.26' to 36'

Ref. software output for design analysis.

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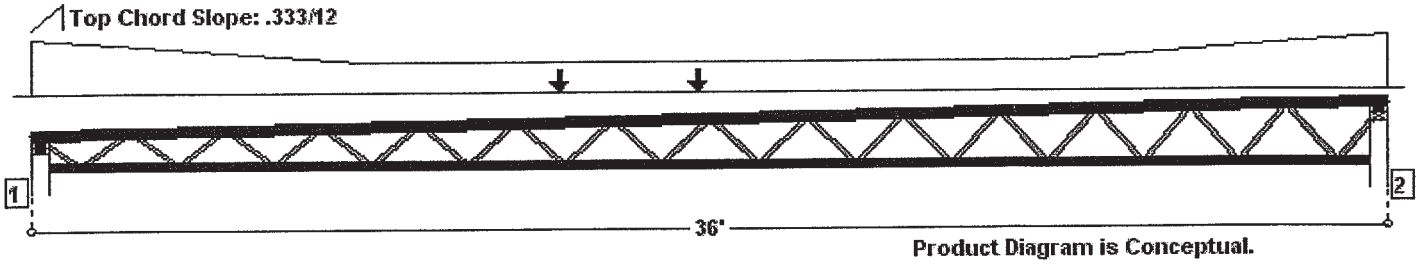
8th Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Roof(1.25)	0	225	17' 8"	-	RTU
Point(lbs)	Roof(1.25)	0	225	14'	-	RTU
Tapered(psf)	Roof(1.25)	39.1 To 0.0	0.0 To 0.0	0 To 8' 8 7/8"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	0.0 To 39.1	0.0 To 0.0	27' 3 1/8" To 36'	Adds To	Tapered drift

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	1895 / 1213 / 0 / 3108
2	Stud wall	5.50"	1896 / 1158 / 0 / 3054

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip. Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (71.8%)	Left Support
Web Controls		N/A	N/A	Passed (96.1%)	Web 21, Compression
Pin Controls		N/A	N/A	Passed (92.2%)	Hankinsons Control, Pin 3, Bottom
Chord Controls		N/A	N/A	Passed (79.6%)	Combined Loading, Tension, Pin 6, Bottom
Live Load Defl (in)		0.613	1.752	Passed (L/686)	MID Span 1 under Roof loading
Total Load Defl (in)		1.121	2.336	Passed (L/375)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 3" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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8th Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.

-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.

-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.

-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.

-Pricing Load (plf) = 171

-Beveled plate required at left support

-Beveled plate required at right support

-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Joist design DATE

BY: CP CK: SHT: OF

11th joist from south.

Span = 36'-0"

Trib. width = 32"

DL = 20 psf

LL = 30 psf

Drift = 39.1 psf

Tapered drift = 39.1 psf to 0 psf from 0' to 8.74'

0 psf to 39.1 psf from 27.26' to 36'

Point loads:

375 lbs @ 21'-6"

375 lbs @ 10'-7"

Ref. software output for design analysis.

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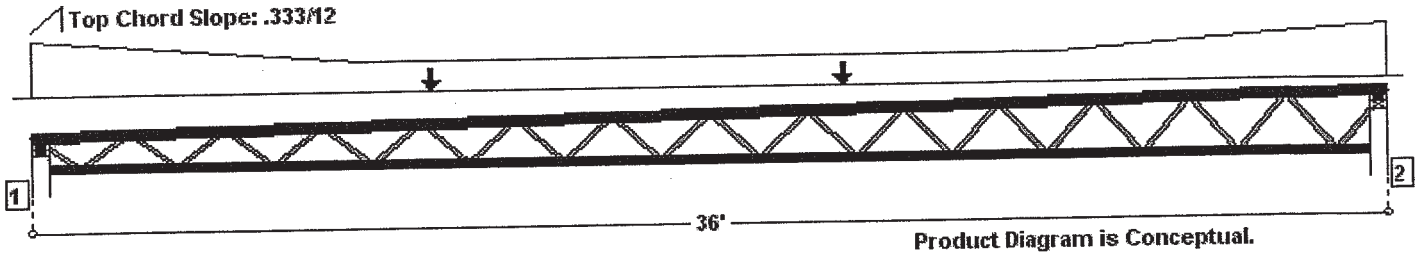
11th Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Roof(1.25)	0	375	21' 6"	-	RTU
Point(lbs)	Roof(1.25)	0	375	10' 7"	-	RTU
Tapered(psf)	Roof(1.25)	39.1 To 0.0	0.0 To 0.0	0 To 8' 8 7/8"	Adds To	Tapered Drift
Tapered(psf)	Roof(1.25)	0.0 To 39.1	0.0 To 0.0	27' 3 1/8" To 36'	Adds To	Tapered Drift

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	1895 / 1377 / 0 / 3272
2	Stud wall	5.50"	1896 / 1294 / 0 / 3190

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (75.6%)	Left Support
Web Controls		N/A	N/A	Passed (88.3%)	Web 2, Compression
Pin Controls		N/A	N/A	Passed (95.9%)	Hankinsons Control, Pin 11, Bottom
Chord Controls		N/A	N/A	Passed (82.6%)	Combined Loading, Tension, Pin 6, Bottom
Live Load Defl (in)		0.613	1.752	Passed (L/686)	MID Span 1 under Roof loading
Total Load Defl (in)		1.185	2.336	Passed (L/355)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 2" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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11th Joist from South

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

ADDITIONAL NOTES:

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-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.
-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.
-Pricing Load (plf) = 179
-Beveled plate required at left support
-Beveled plate required at right support
-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Joist design DATE

BY: CP CK: SHT: OF

12th Joist from North

Span = 36'-0"

- W_1 = DL + LL

DL = 20 psf (2.667') = 54 plf

LL = 30 psf (2.667') = 80 plf

- Parapet wall.- parapet h = 23'-0" ; b.o. trusses = 11'-6"

wall h = 23'-0" - 14'-2" = 8'-10"

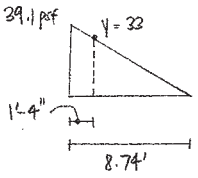
11'-6" + 32" (truss depth) = 14'-2" (b.o. deck)

W_2 = (15 psf)(8.83') = 133 plf

- Roof (DL+LL)

W_3 = (50 psf)(0.667') = 34 plf

- Drift.



$\frac{39.1}{8.74} = \frac{y}{7.4}$ y = 33 psf

drift avg = $\frac{39.1 + 33}{2}$ = 36 psf

W_4 = (36 psf)(1.33') = 48 plf

- W_5 = 39.1 psf (2.667') = 104 plf

- Point loads.-

Parapet.-

P_1 = (133 plf)(1.33') = 178 lbs

+ (50 psf)(2.25')(1.33') = 150 lbs

P_1 = 178 lbs + 150 lbs = 328 lbs

Ronald A Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

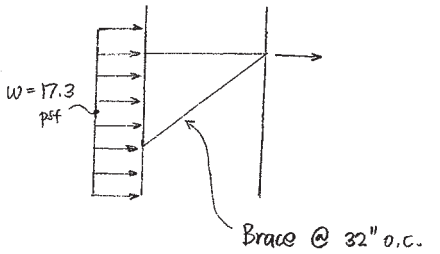
SUBJECT: Joist design DATE

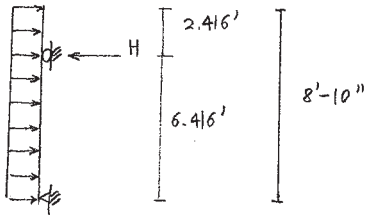
BY: CP CK: SHT: OF

P_2 = 338 lbs (RTU)

P_3 = 95 lbs (EF)

P_4: wind from tower

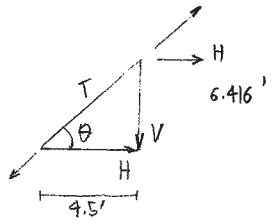




For 1'-0" width of parapet

$w = (17.3\ psf)(1.0) = 17.3\ plf$

$H = \frac{w}{2l}(l+a)^2 = \frac{17.3\ plf}{2(6.416)}(8.83)^2 = 105$ lbs (per foot of wall)



$\tan\theta = \frac{6.416}{4.5}$ $\theta = 55°$

$\tan 55° = \frac{V}{H}$

$V = 105\ lbs \tan 55 = 150$ lbs (per foot of wall)

$P_4 = (150\ lbs)(1.33') = 200$ lbs

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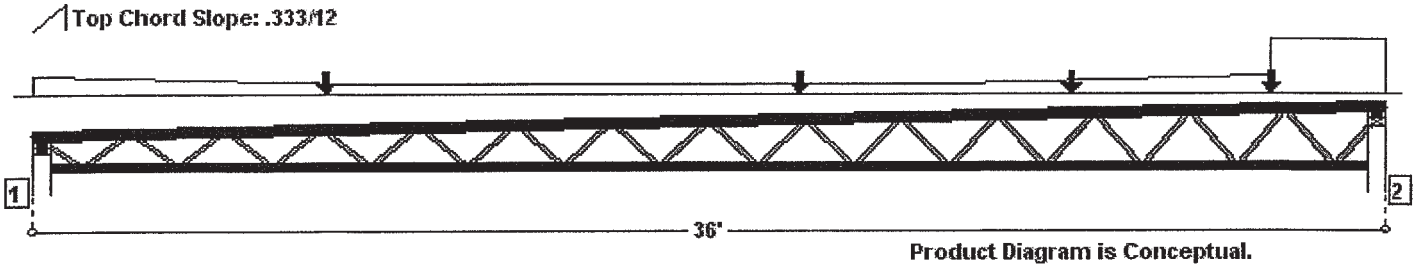
12th Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(plf)	Roof(1.25)	0.0	133.0	33' To 36'	Adds To	Parapet wall load
Uniform(plf)	Roof(1.25)	20.0	14.0	33' To 36'	Adds To	Roof (DL+LL)
Uniform(plf)	Roof(1.25)	48.0	0.0	33' To 36'	Adds To	Drift
Tapered(psf)	Roof(1.25)	0.0 To 39.1	0.0 To 0.0	24' 3 1/8" To 33'	Adds To	Snow drift
Point(lbs)	Roof(1.25)	0	328	33'	-	Parapet point load
Point(lbs)	Roof(1.25)	0	338	20' 5"	-	RTU
Point(lbs)	Roof(1.25)	0	338	27' 8"	-	RTU
Point(lbs)	Roof(1.25)	0	95	7' 10"	-	EF
Point(lbs)	Roof(1.25)	0	200	33'	-	Wind from tower
Tapered(psf)	Roof(1.25)	39.1 To 0.0	0.0 To 0.0	0 To 8' 8 7/8"	Adds To	Snow drift

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	1940 / 1307 / 0 / 3247
2	Stud wall	5.50"	2055 / 2354 / 0 / 4409

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (101.8%)	Right Support
Web Controls		N/A	N/A	Passed (96.3%)	Web 23, Compression
Pin Controls		N/A	N/A	Passed (99.9%)	Perpendicular to Grain Control, Pin 13, Top
Chord Controls		N/A	N/A	Passed (85.9%)	Combined Loading, Tension, Pin 7, Bottom
Live Load Defl (in)		0.649	1.752	Passed (L/647)	MID Span 1 under Roof loading
Total Load Defl (in)		1.241	2.336	Passed (L/339)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 1" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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12th Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

ADDITIONAL NOTES:

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-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.

-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.

-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.

-Pricing Load (plf) = 213

-Beveled plate required at left support

-Beveled plate required at right support

-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Joist design DATE

BY: CP CK: SHT: OF

9th Joist from North

span = 36'-0"

- W_1 = DL + LL

  DL = 20 psf (2.667') = 54 plf

  LL = 30 psf (2.667') = 80 plf

- W_5 = 39.1 psf to 0 psf

- Point loads:

  Parapet:- P_1 = 328 lbs (2) = 656 lbs (since trib. width is 2'-6" then P_1 will be doubled: from previous calc.)
  both ends

- P_4 = wind from tower = 400 lbs " " "

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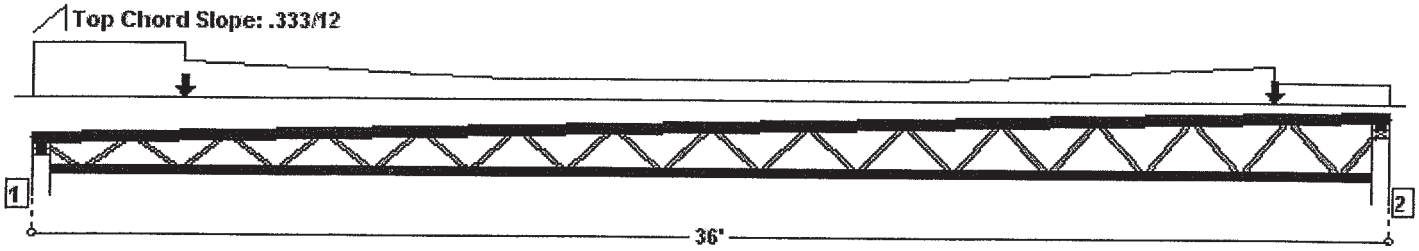
9th Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Tapered(psf)	Roof(1.25)	0.0 To 39.1	0.0 To 0.0	24' 3 1/8" To 33'	Adds To	Snow drift
Point(lbs)	Roof(1.25)	0	656	33'	-	Parapet point load
Point(lbs)	Roof(1.25)	0	656	4'	-	Parapet point load
Point(lbs)	Roof(1.25)	0	400	4'	-	Wind from tower
Uniform(plf)	Roof(1.25)	20.0	14.0	0 To 4'	Adds To	Roof (DL+LL)
Uniform(plf)	Roof(1.25)	48.0	0.0	0 To 4'	Adds To	Drift
Tapered(psf)	Roof(1.25)	39.1 To 0.0	0.0 To 0.0	4' To 12' 8 7/8"	Adds To	Snow drift

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	2142 / 2011 / 0 / 4153
2	Stud wall	5.50"	1921 / 1678 / 0 / 3599

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (95.9%)	Left Support
Web Controls		N/A	N/A	Passed (95.7%)	Web 4, Compression
Pin Controls		N/A	N/A	Passed (100.1%)	Hankinsons Control, Pin 1, Bottom
Chord Controls		N/A	N/A	Passed (84.2%)	Combined Loading, Tension, Pin 6, Bottom
Live Load Defl (in)		0.706	1.752	Passed (L/595)	MID Span 1 under Roof loading
Total Load Defl (in)		1.229	2.336	Passed (L/342)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 2" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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9th Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 32" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

ADDITIONAL NOTES:

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-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.

-Pricing Load (plf) = 215

-Beveled plate required at left support

-Beveled plate required at right support

-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

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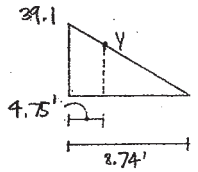
2nd. Joist from north:

Span = 36'-0" trib. width = 1'-10½"

DL = 20 psf
LL = 30 psf
} w_1

- Parallel drift : 18 psf from 0' to 11'-7" & from 24'-7" to 36



$\frac{39.1}{8.74} = \frac{y}{3.99}$ $y = 18$ psf

- Tapered drift : 39.1 psf to 18 psf from 0' to 4'-9" & from 24'-7" to 29'-4"

18 psf to 39.1 psf from 6'-10" to 11'-7" & from 31'-3" to 36'-0"

- Parapet wall :-

parapet H = 20'-10" ; b.o. trusses = 11'-6" ; 11'-6" + 26" (avg. truss depth) = 13'-8" b.o. deck

wall H = 20'-10" − 13'-8" = 7'-2"

w_2 = (15 psf)(7.167') = 108 plf from 11'-7" to 24'-7"

- Roof (DL + LL)

w_3 = (50 psf)(3.0) = 150 plf from 11'-7" to 24'-7" (3.0 = ½ tower width 6/2)

- Point loads :-

Parapet :-

P_1 = (108 plf)(1.33) = 144 lbs

(50 psf)(8")(1.33') = 45 lbs

P_1 = 144 + 45 = 189 lbs @ 11'-7" and 24'-7"

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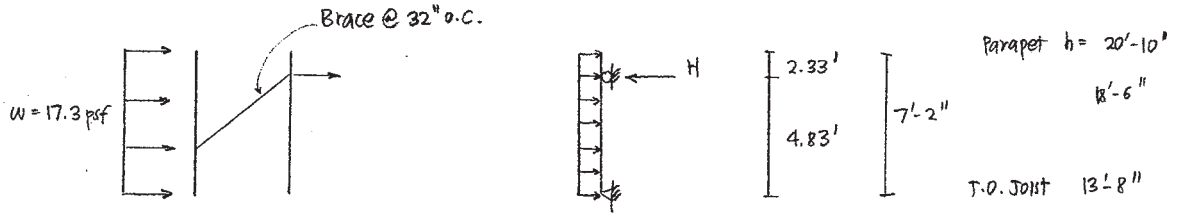
PROJECT: Panda Express JOB NO.

SUBJECT: Joist design DATE

BY: CP CK: SHT: OF

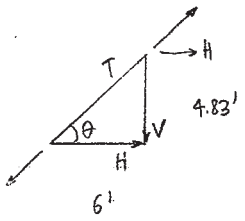
P_2 = wind from tower



For 1'-0" width of parapet

$w = 17.3\ psf\ (1.0') = 17.3\ plf$

$H = \frac{w}{2l}(l+a)^2 = \frac{17.3\ plf}{2(4.83')}(7.167')^2 = 92\ lbs$ (per foot of wall)



$\tan\theta = \frac{4.83}{6'}$ $\theta = 39°$

$\tan 39° = \frac{V}{H}$

$V = 92\ lbs \tan 39 = 75\ lbs$ (per foot of wall)

$P = (75\ lbs)(1.33') = 100\ lbs$

Drift:-

$39.1\ psf\ (6.5"/12) = 21.2\ plf$ from 11'-7" to 24'-7"

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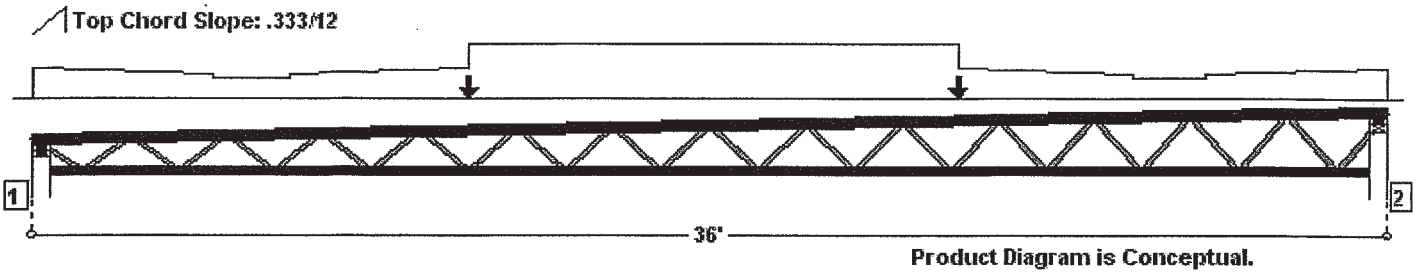
2nd Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 16" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Roof (psf): 30.0 Live at 125 % duration, 20.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(psf)	Roof(1.25)	18.0	0.0	0 To 11' 7"	Adds To	Parallel drift
Uniform(psf)	Roof(1.25)	18.0	0.0	24' 7" To 36'	Adds To	Parallel drift
Tapered(psf)	Roof(1.25)	39.1 To 18.0	0.0 To 0.0	0 To 4' 9"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	39.1 To 18.0	0.0 To 0.0	24' 7" To 29' 4"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	18.0 To 39.1	0.0 To 0.0	6' 10" To 11' 7"	Adds To	Tapered drift
Tapered(psf)	Roof(1.25)	18.0 To 39.1	0.0 To 0.0	31' 3" To 36'	Adds To	Tapered drift
Uniform(plf)	Roof(1.25)	0.0	54.0	11' 7" To 24' 7"	Adds To	Parapet wall
Uniform(plf)	Roof(1.25)	0.0	75.0	11' 7" To 24' 7"	Adds To	Roof (DL+LL)
Point(lbs)	Roof(1.25)	0	95	11' 7"	-	Parapet
Point(lbs)	Roof(1.25)	0	95	24' 7"	-	Parapet
Point(lbs)	Roof(1.25)	0	50	11' 7"	-	Wind from tower
Point(lbs)	Roof(1.25)	0	50	24' 7"	-	Wind from tower
Uniform(plf)	Roof(1.25)	10.6	0.0	11' 7" To 24' 7"	Adds To	Drift along tower

SUPPORTS:

		Input Width	Vertical Reactions (lbs) Live/Dead/Uplift/Total
1	Stud wall	5.50"	1426 / 1459 / 0 / 2885
2	Stud wall	5.50"	1427 / 1469 / 0 / 2896

-Left Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"
-Right Support: Top-(TJM) S-Clip, Approx. clip height: 3 5/8", Approx. clip width: 7 3/4"

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

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2nd Joist from North

20"(end)-32"(end) TJM Open Web Truss @ 16" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Bearing Controls		N/A	N/A	Passed (66.9%)	Right Support
Web Controls		N/A	N/A	Passed (95.7%)	Web 23, Compression
Pin Controls		N/A	N/A	Passed (98.5%)	Hankinsons Control, Pin 10, Bottom
Chord Controls		N/A	N/A	Passed (82.6%)	Combined Loading, Tension, Pin 7, Bottom
Live Load Defl (in)		0.486	1.752	Passed (L/864)	MID Span 1 under Roof loading
Total Load Defl (in)		1.237	2.336	Passed (L/340)	MID Span 1 under Roof loading

-Deflection Criteria: STANDARD(LL:L/240,TL:L/180).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 3' 1" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

ADDITIONAL NOTES:

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-Allowable Stress Design methodology was used for Building Code IBC analyzing the TJ Custom product listed above.
-The open web truss analysis presented is approximate. All open web trusses are custom designed to carry the specific design loads for each project. Actual truss capacity when fabricated is limited to that required to resist the specified loads. Do not use this analysis to verify the capacity of existing trusses.
-Pricing Load (plf) = 161
-Beveled plate required at left support
-Beveled plate required at right support
-Truss design includes consideration for partial span application live load.

PROJECT INFORMATION:

Panda Express

OPERATOR INFORMATION:

Carmen Parra, E.I.T.
Ronald A. Roberts Associates, Inc.
1420 W. Mockingbird Lane
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S:\07173 Panda Express - Riverton, UT\2nd Joist from North.sms

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Header design DATE

BY: CP CK: SHT: OF

Header @ hatch.

Span = 3'-6"

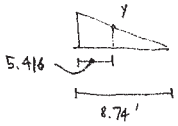
Reaction from 3rd. joist south : span = 28'-4"

DL = 20 psf (2.667') = 54 plf

LL = 30 psf (2.667') = 80 plf

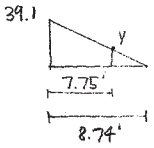
- Parallel snow drift = 14.8 psf (along joist)

$\frac{39.1}{8.74} = \frac{y}{3.32}$



- Tapered drift = 14.8 psf to 39.1 psf from 22.91' to 28.33'

- Tapered drift (left side) : 4.4 psf from 0' to 1'

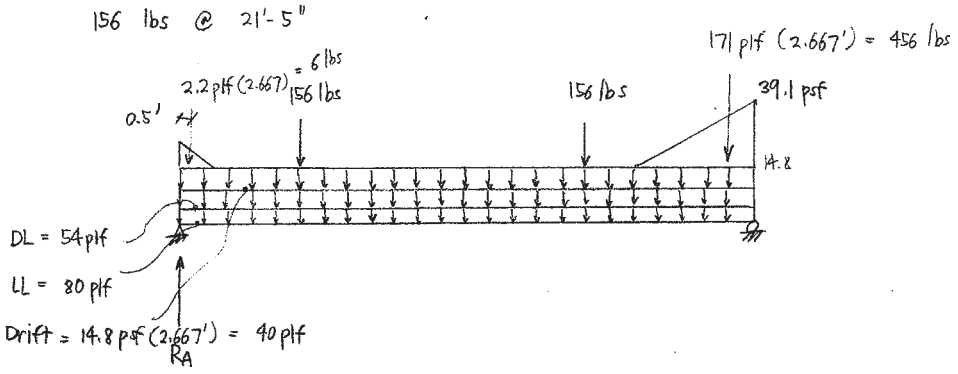


$\frac{39.1}{8.74} - \frac{y}{0.99}$ $y = 4.42$

- Point loads :

156 lbs @ 11'-5"

156 lbs @ 21'-5"



$\Sigma M_B = 0 = -54 \text{ plf}(28.33')(28.33/2) - 80 \text{ plf}(28.33')(28.33/2) - 40 \text{ plf}(19.5)(19.5/2) - 6 \text{ lbs}(27.83)$
$- 156 \text{ lbs}(16.83') - 156 \text{ lbs}(6.917') - 456 \text{ lbs}(2.91) + 28.33 R_A$

$R_A = 2350 \text{ lbs}$

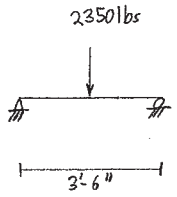
Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Header design DATE _____

BY: CP CK: _____ SHT: _____ OF _____

Actual header will carry: (DL, LL, point load)



Ref. enercalc software output for design analysis.

Title :
Dsgnr:
Description :

Job #
Date: 10:58AM, 21 MAY 07

Scope :

Rev: 580004
User: KW-0606725, Ver 5.8.0, 1-Dec-2003

General Timber Beam

Description Header at hatch

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	6x8	Center Span	3.50 ft	.....Lu	3.50 ft
Beam Width	5.500 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	7.500 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.2			
		Fb Base Allow	900.0 psi		
Load Dur. Factor	1.250	Fv Allow	90.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	625.0 psi		
		E	1,600.0 ksi		

Full Length Uniform Loads

Center	DL	54.00 #/ft	LL	80.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Point Loads

Dead Load	2,350.0 lbs	lbs	lbs	lbs	lbs	lbs	lbs
Live Load	lbs	lbs	lbs	lbs	lbs	lbs	lbs
...distance	1.750 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft

Summary

Beam Design OK

Span= 3.50ft, Beam Width = 5.500in x Depth = 7.5in, Ends are Pin-Pin

Max Stress Ratio	0.469 : 1		
Maximum Moment	2.3 k-ft	Maximum Shear * 1.5	2.0 k
Allowable	4.8 k-ft	Allowable	4.6 k

Max. Positive Moment	2.26 k-ft	at	1.750 ft	Shear: @ Left	1.41 k
Max. Negative Moment	0.00 k-ft	at	0.000 ft	@ Right	1.41 k
Max @ Left Support	0.00 k-ft			Camber: @ Left	0.000 in
Max @ Right Support	0.00 k-ft			@ Center	0.018 in
Max. M allow	4.83			@ Right	0.000 in

				Reactions...			
fb	526.30 psi	fv	48.25 psi	Left DL	1.27 k	Max	1.41 k
Fb	1,123.00 psi	Fv	112.50 psi	Right DL	1.27 k	Max	1.41 k

Deflections

Center Span...	Dead Load	Total Load
Deflection	-0.012 in	-0.013 in
...Location	1.750 ft	1.750 ft
...Length/Defl	3,410.9	3,185.06

Camber (using 1.5 * D.L. Defl) ...

@ Center	0.018 in
@ Left	0.000 in
@ Right	0.000 in

Left Cantilever...	Dead Load	Total Load
Deflection	0.000 in	0.000 in
...Length/Defl	0.0	0.0

Right Cantilever...		
Deflection	0.000 in	0.000 in
...Length/Defl	0.0	0.0

Title :
Dsgnr:
Description :

Job #
Date: 10:58AM, 21 MAY 07

Scope :

Description Header at hatch

Stress Calcs

Bending Analysis

Ck	30.585	Le	7.207 ft	Sxx	51.563 in3	Area	41.250 in2
Cf	1.000	Rb	4.632	Cl	0.998		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	2.26 k-ft	24.16 in3	1,123.00 psi
@ Left Support	0.00 k-ft	0.00 in3	1,125.00 psi
@ Right Support	0.00 k-ft	0.00 in3	1,125.00 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	1.99 k	1.99 k
Area Required	17.693 in2	17.693 in2
Fv: Allowable	112.50 psi	112.50 psi

Bearing @ Supports

Max. Left Reaction	1.41 k	Bearing Length Req'd	0.410 in
Max. Right Reaction	1.41 k	Bearing Length Req'd	0.410 in

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	1.41 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: 2x Framing DATE

BY: CP CK: SHT: OF

At 3rd. joist from south :

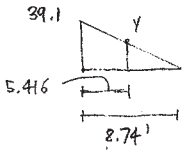
Span = 5'-0"

trib. width = 32"

DL = 20 psf (2.667') = 54 plf

LL = 30 psf (2.667') = 80 plf

- Parallel snow drift : 14.8 psf



$\frac{39.1}{8.74} = \frac{y}{3.32}$ $y = 14.8$ psf

- Tapered snow drift : 39.1 psf to 14.8 psf from 0 to 5'

Ref. enercalc software output for design analysis.

Title :
Dsgnr:
Description :

Job #
Date: 11:52AM, 21 MAY 07

Scope :

Rev: 580004
User: KW-0606725, Ver 5.8.0, 1-Dec-2003
(c)1983-2003 ENERCALC Engineering Software

General Timber Beam

Description 2X Framing

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	2x6	Center Span	5.00 ft	.....Lu	5.00 ft
Beam Width	1.500 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	5.500 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.2			
		Fb Base Allow	900.0 psi		
Load Dur. Factor	1.250	Fv Allow	90.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	1,350.0 psi		
		E	1,600.0 ksi		

Full Length Uniform Loads

Center	DL	54.00 #/ft	LL	80.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Trapezoidal Loads

#1	DL @ Left	#/ft	LL @ Left	14.80 #/ft	Start Loc	0.000 ft
	DL @ Right	#/ft	LL @ Right	14.80 #/ft	End Loc	5.000 ft
#2	DL @ Left	#/ft	LL @ Left	39.10 #/ft	Start Loc	0.000 ft
	DL @ Right	#/ft	LL @ Right	14.80 #/ft	End Loc	5.000 ft

Summary

Beam Design OK

Span= 5.00ft, Beam Width = 1.500in x Depth = 5.5in, Ends are Pin-Pin

Max Stress Ratio	0.632 : 1		
Maximum Moment	0.5 k-ft	Maximum Shear * 1.5	0.6 k
Allowable	0.9 k-ft	Allowable	0.9 k
Max. Positive Moment	0.55 k-ft at 2.480 ft	Shear: @ Left	0.45 k
Max. Negative Moment	0.00 k-ft at 0.000 ft	@ Right	0.43 k
Max @ Left Support	0.00 k-ft	Camber: @ Left	0.000 in
Max @ Right Support	0.00 k-ft	@ Center	0.034 in
Max. M allow	0.87	@ Right	0.000 in

Reactions...

fb	871.59 psi	fv	66.78 psi	Left DL	0.13 k	Max	0.45 k
Fb	1,379.23 psi	Fv	112.50 psi	Right DL	0.13 k	Max	0.43 k

Deflections

Center Span...	Dead Load	Total Load
Deflection	-0.023 in	-0.074 in
...Location	2.500 ft	2.500 ft
...Length/Defl	2,629.2	807.83

Camber (using 1.5 * D.L. Defl) ...

@ Center	0.034 in
@ Left	0.000 in
@ Right	0.000 in

Left Cantilever...	Dead Load	Total Load
Deflection	0.000 in	0.000 in
...Length/Defl	0.0	0.0

Right Cantilever...

Deflection	0.000 in	0.000 in
...Length/Defl	0.0	0.0

Ronald A. Roberts Associates, Inc. Consulting Engineers

PROJECT: Bandit Express JOB NO.

SUBJECT: Header Design DATE

BY: C.P. CK: SHT: OF

At towers.

Span = 7'-0"

DL = 20 psf + 5 psf (m.e.) = 25 psf

LL = 30.1 psf

W_{DL} = 25 (18 + 2.125) + 15 (14.5) = 721 plf

W_{LL} = 30.1 (18 + 2.125) = 606 plf

trib width = 35 ft/2 = 18'-0" (roof)
14'-6" (wall)
2'-1½" (roof)

Ref. enercalc software output for design analysis.

At back tower.

Span = 10'-0"

DL = 20 psf + 5 psf = 25 psf

LL = 30.1 psf

W_{DL} = 25 (2.125) + 15 (14.5) = 271 plf

W_{LL} = 30.1 (2.125) = 64 plf

trib. width = 14'-6" (wall)
2'-1½" (roof)

Ref. enercalc software output for design analysis

Title :
Dsgnr:
Description :

Job #
Date: 6:38AM, 22 MAY 07

Scope :

General Timber Beam

Description Header at towers

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	6x10	Center Span	7.00 ft	.....Lu	7.00 ft
Beam Width	5.500 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	9.500 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.2			
		Fb Base Allow	1,200.0 psi		
Load Dur. Factor	1.250	Fv Allow	85.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	825.0 psi		
		E	1,500.0 ksi		

Full Length Uniform Loads

Center	DL	721.00 #/ft	LL	606.00 #/ft	
Left Cantilever	DL	#/ft	LL	#/ft	
Right Cantilever	DL	#/ft	LL	#/ft	

Summary

Beam Design OK

Span= 7.00ft, Beam Width = 5.500in x Depth = 9.5in, Ends are Pin-Pin

Max Stress Ratio	0.974 : 1		
Maximum Moment	8.1 k-ft	Maximum Shear * 1.5	5.4 k
Allowable	10.3 k-ft	Allowable	5.6 k

Max. Positive Moment	8.13 k-ft	at	3.500 ft	Shear:	@ Left	4.64 k
Max. Negative Moment	0.00 k-ft	at	0.000 ft		@ Right	4.64 k
Max @ Left Support	0.00 k-ft			Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft				@ Center	0.099 in
					@ Right	0.000 in
Max. M allow	10.27			Reactions...		
fb 1,178.96 psi	fv	103.47 psi		Left DL	2.52 k	Max	4.64 k
Fb 1,490.11 psi	Fv	106.25 psi		Right DL	2.52 k	Max	4.64 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.066 in	-0.122 in	Deflection	0.000 in	0.000 in
...Location	3.500 ft	3.500 ft	...Length/Defl	0.0	0.0
...Length/Defl	1,271.2	690.70	**Right Cantilever...**		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.099 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

Stress Calcs

Bending Analysis

Ck	25.646	Le	13.710 ft	Sxx	82.729 in3	Area	52.250 in2
Cf	1.000	Rb	7.189	Cl	0.993		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	8.13 k-ft	65.45 in3	1,490.11 psi
@ Left Support	0.00 k-ft	0.00 in3	1,500.00 psi
@ Right Support	0.00 k-ft	0.00 in3	1,500.00 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	5.41 k	5.41 k
Area Required	50.882 in2	50.882 in2
Fv: Allowable	106.25 psi	106.25 psi

Bearing @ Supports

Max. Left Reaction	4.64 k	Bearing Length Req'd	1.024 in
Max. Right Reaction	4.64 k	Bearing Length Req'd	1.024 in

Title :
Dsgnr:
Description :

Job #
Date: 6:38AM, 22 MAY 07

Scope :

Description Header at towers

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	4.64 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

Title :
Dsgnr:
Description :

Job #
Date: 11:52AM, 21 MAY 07

Scope :

Description 2X Framing

Stress Calcs

Bending Analysis

Ck	30.585	Le	9.471 ft	Sxx	7.563 in3	Area	8.250 in2
Cf	1.300	Rb	16.671	Cl	0.943		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	0.55 k-ft	4.78 in3	1,379.23 psi
@ Left Support	0.00 k-ft	0.00 in3	1,462.50 psi
@ Right Support	0.00 k-ft	0.00 in3	1,462.50 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	0.55 k	0.54 k
Area Required	4.897 in2	4.757 in2
Fv: Allowable	112.50 psi	112.50 psi

Bearing @ Supports

Max. Left Reaction	0.45 k	Bearing Length Req'd	0.222 in
Max. Right Reaction	0.43 k	Bearing Length Req'd	0.212 in

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	0.45 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

Title :
Dsgnr:
Description :

Job #
Date: 1:31PM, 21 MAY 07

Scope :

General Timber Beam

Description Header at back tower

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	6x10	Center Span	10.00 ft	.....Lu	10.00 ft
Beam Width	5.500 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	9.500 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.2			
		Fb Base Allow	1,200.0 psi		
Load Dur. Factor	1.250	Fv Allow	85.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	825.0 psi		
		E	1,500.0 ksi		

Full Length Uniform Loads

Center	DL	271.00 #/ft	LL	165.00 #/ft	
Left Cantilever	DL	#/ft	LL	#/ft	
Right Cantilever	DL	#/ft	LL	#/ft	

Summary

Beam Design OK

Span= 10.00ft, Beam Width = 5.500in x Depth = 9.5in, Ends are Pin-Pin

Max Stress Ratio	0.532 : 1		
Maximum Moment	5.4 k-ft	Maximum Shear * 1.5	2.8 k
Allowable	10.2 k-ft	Allowable	5.6 k

Max. Positive Moment	5.45 k-ft	at	5.000 ft	Shear:	@ Left	2.18 k
Max. Negative Moment	0.00 k-ft	at	0.000 ft		@ Right	2.18 k
Max @ Left Support	0.00 k-ft			Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft				@ Center	0.155 in
Max. M allow	10.24				@ Right	0.000 in
fb 790.53 psi	fv 53.07 psi			Reactions...		
Fb 1,486.02 psi	Fv 106.25 psi			Left DL 1.35 k	Max	2.18 k
				Right DL 1.35 k	Max	2.18 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.103 in	-0.166 in	Deflection	0.000 in	0.000 in
...Location	5.000 ft	5.000 ft	...Length/Defl	0.0	0.0
...Length/Defl	1,160.1	721.05	**Right Cantilever...**		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.155 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

Stress Calcs

Bending Analysis

Ck	25.646	Le	18.568 ft	Sxx	82.729 in3	Area	52.250 in2
Cf	1.000	Rb	8.367	Cl	0.991		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	5.45 k-ft	44.01 in3	1,486.02 psi
@ Left Support	0.00 k-ft	0.00 in3	1,500.00 psi
@ Right Support	0.00 k-ft	0.00 in3	1,500.00 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	2.77 k	2.77 k
Area Required	26.098 in2	26.098 in2
Fv: Allowable	106.25 psi	106.25 psi

Bearing @ Supports

Max. Left Reaction	2.18 k	Bearing Length Req'd	0.480 in
Max. Right Reaction	2.18 k	Bearing Length Req'd	0.480 in

Title :
Dsgnr:
Description :

Job #
Date: 1:31PM, 21 MAY 07

Scope :

Description Header at back tower

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	2.18 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

At right elev.

Span = 12'-6"

DL = 20 psf + 5 psf (m.e.) = 25 psf

LL = 30.1 psf

trib. width = 18'-0" (roof)

14'-6" (wall)

W_{DL} = 25 (18) + 15 (14.5) = 667.5 plf

W_{LL} = 30.1 (18) = 542 plf

W_{drift} = 47.5 psf (18') = 855 plf

Ref. enercalc software output for design analysis.

Left elev.

Span = 10'-0"

DL = 20 psf + 5 psf (m.e.) = 25 psf

LL = 30.1 psf

trib. width = 18'-0" (roof)

14'-6" (wall)

W_{DL} = 25 (18) + 15 (14.5) = 667.5 plf

W_{LL} = 30.1 (18) = 542 plf

W_{drift} = 47.5 psf (18') = 855 plf

Ref. enercalc software output for design analysis.

Title :
Dsgnr:
Description :

Job #
Date: 6:39AM, 22 MAY 07

Scope :

General Timber Beam

Description Headers at right elev.

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	5.125x15	Center Span	12.50 ft	.....Lu	12.50 ft
Beam Width	5.125 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	15.000 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	GluLam	Douglas Fir, 24F - V8			
		Fb Base Allow	2,400.0 psi		
Load Dur. Factor	1.250	Fv Allow	240.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	650.0 psi		
		E	1,700.0 ksi		

Full Length Uniform Loads

Center	DL	667.50 #/ft	LL	1,397.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Summary

Beam Design OK

Span= 12.50ft, Beam Width = 5.125in x Depth = 15.in, Ends are Pin-Pin

Max Stress Ratio	0.875 : 1		
Maximum Moment	40.3 k-ft	Maximum Shear * 1.5	15.5 k
Allowable	46.1 k-ft	Allowable	23.1 k

Max. Positive Moment	40.32 k-ft	at	6.250 ft	Shear:	@ Left	12.90 k
Max. Negative Moment	0.00 k-ft	at	12.500 ft		@ Right	12.90 k
Max @ Left Support	0.00 k-ft			Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft				@ Center	0.224 in
Max. M allow	46.10				@ Right	0.000 in

				Reactions...			
fb	2,517.68 psi	fv	201.41 psi	Left DL	4.17 k	Max	12.90 k
Fb	2,878.70 psi	Fv	300.00 psi	Right DL	4.17 k	Max	12.90 k

Deflections

	Dead Load	Total Load		Dead Load	Total Load
Center Span...			**Left Cantilever...**		
Deflection	-0.150 in	-0.463 in	Deflection	0.000 in	0.000 in
...Location	6.250 ft	6.250 ft	...Length/Defl	0.0	0.0
...Length/Defl	1,002.5	324.12	**Right Cantilever...**		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.224 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

Stress Calcs

Bending Analysis

Ck	19.306	Le	23.990 ft	Sxx	192.188 in3	Area	76.875 in2
Cf	1.000	Rb	12.825	Cl	0.960		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	40.32 k-ft	168.09 in3	2,878.70 psi
@ Left Support	0.00 k-ft	0.00 in3	3,000.00 psi
@ Right Support	0.00 k-ft	0.00 in3	3,000.00 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	15.48 k	15.48 k
Area Required	51.612 in2	51.612 in2
Fv: Allowable	300.00 psi	300.00 psi

Bearing @ Supports

Max. Left Reaction	12.90 k	Bearing Length Req'd	3.873 in
Max. Right Reaction	12.90 k	Bearing Length Req'd	3.873 in

Title :
Dsgnr:
Description :

Job #
Date: 6:39AM, 22 MAY 07

Scope :

Description Headers at right elev.

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	12.90 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

Title :
Dsgnr:
Description :

Job #
Date: 6:40AM, 22 MAY 07

Scope :

General Timber Beam

Description Headers at left elev.

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	5.125x12	Center Span	10.00 ft	.....Lu	10.00 ft
Beam Width	5.125 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	12.000 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	GluLam	Douglas Fir, 24F - V8			
		Fb Base Allow	2,400.0 psi		
Load Dur. Factor	1.250	Fv Allow	240.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	650.0 psi		
		E	1,700.0 ksi		

Full Length Uniform Loads

Center	DL	667.50 #/ft	LL	1,397.00 #/ft	
Left Cantilever	DL	#/ft	LL	#/ft	
Right Cantilever	DL	#/ft	LL	#/ft	

Summary

Beam Design OK

Span= 10.00ft, Beam Width = 5.125in x Depth = 12.in, Ends are Pin-Pin

Max Stress Ratio	0.857 : 1		
Maximum Moment	25.8 k-ft	Maximum Shear * 1.5	12.4 k
Allowable	30.1 k-ft	Allowable	18.5 k

Max. Positive Moment	25.81 k-ft	at	5.000 ft	Shear:	@ Left	10.32 k
Max. Negative Moment	0.00 k-ft	at	0.000 ft		@ Right	10.32 k
Max @ Left Support	0.00 k-ft			Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft				@ Center	0.180 in
					@ Right	0.000 in
Max. M allow	30.11			Reactions...		
fb 2,517.68 psi	fv 201.41 psi			Left DL 3.34 k	Max	10.32 k
Fb 2,937.45 psi	Fv 300.00 psi			Right DL 3.34 k	Max	10.32 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.120 in	-0.370 in	Deflection	0.000 in	0.000 in
...Location	5.000 ft	5.000 ft	...Length/Defl	0.0	0.0
...Length/Defl	1,002.5	324.12	**Right Cantilever...**		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.180 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

Stress Calcs

Bending Analysis

Ck	19.306	Le	19.192 ft	Sxx	123.000 in3	Area	61.500 in2
Cf	1.000	Rb	10.260	Cl	0.979		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	25.81 k-ft	105.42 in3	2,937.45 psi
@ Left Support	0.00 k-ft	0.00 in3	3,000.00 psi
@ Right Support	0.00 k-ft	0.00 in3	3,000.00 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	12.39 k	12.39 k
Area Required	41.290 in2	41.290 in2
Fv: Allowable	300.00 psi	300.00 psi

Bearing @ Supports

Max. Left Reaction	10.32 k	Bearing Length Req'd	3.099 in
Max. Right Reaction	10.32 k	Bearing Length Req'd	3.099 in

Title :
Dsgnr:
Description :

Job #
Date: 6:40AM, 22 MAY 07

Scope :

Description Headers at left elev.

Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	0.00 k-ft	10.32 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Footing design DATE _____

BY: CP CK: _____ SHT: _____ OF _____

Footing #1.

Reaction from gl. bm. = 12.90k

Roof = (50 psf)(18 ft)(1.33 ft) = 1200 lbs = 1.2k

P_{total} = 12.9k + 1.2k = 14.1k

$$\frac{14,100 \text{ lbs}}{2,900 \text{ psf}} = 4.86 \text{ ft}^2$$

$\sqrt{4.86 \text{ ft}^2}$ = 2.2 ft

Use 2'-6" x 2'-6" footing.

Footing #2.

Reaction from gl. bm. = 10.32k

P_{total} = 10.32k x 2 = 20.64k

$$\frac{20,640 \text{ lbs}}{2,900 \text{ psf}} = 7.11 \text{ ft}^2$$

$\sqrt{7.11 \text{ ft}^2}$ = 2.66 ft

Use 3'-0" x 3'-0" footing

Footing #3.

Reaction from gl. bm. = 10.32k = P_{total}

$$\frac{10,320 \text{ lbs}}{2,900 \text{ psf}} = 3.55 \text{ ft}^2$$

$\sqrt{3.55 \text{ ft}^2}$ = 1.88'

Use 2'-0" x 2'-0" footing

Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO. _____

SUBJECT: Footing design DATE _____

BY: CP CK: _____ SHT: _____ OF _____

Footing # 4.

Reaction from 6 x 10 = 4.64 K

Ptotal = 4.64 K

$\frac{4,640 \text{ lbs}}{2,900 \text{ psf}} = 1.6 \text{ ft}^2$

$\sqrt{1.6 \text{ ft}^2} = 1.26'$

Use 1'-6" x 1'-6" footing.

Wind Load : per 2006 IBC

Wind speed : 90 mph

Exposure : C

Use Simplified Wind Load Method (ASCE 7-05) :

$p_s = \lambda K_{zt} I p_{s30}$

λ = 1.21 (Fig. 6-2 ASCE 7-05 p40) H = 15 ft

K_{zt} = 1.0 (ASCE 7-05 section 6.5.7 p26)

I = 1.0 (table 6-1 ASCE 7-05 p 77)

p_{s30} = 17.8 psf (Roof angle 20° fig 6-2 p38 ASCE 7-05)

p_s = (1.21)(1.0)(1.0)(17.8) = 21.5 psf (Horizontal)

Uplift on roof elements

$p_{net} = \lambda K_{zt} I p_{net30}$

λ = 1.21 (Fig. 6-3 ASCE 7-05 p44) H = 15 ft

K_{zt} = 1.0

I = 1.00

p_{net30} = 26.9 psf (Zone 3; Effective area = 100 sf) fig 6-3 p42

p_{net} = (1.21)(1.0)(1.0)(26.9) = 32.5 psf (Vertical gross)

Net wind load = 32.5 psf − (20/2) = 22.5 psf (Vertical) (net, components and cladding)

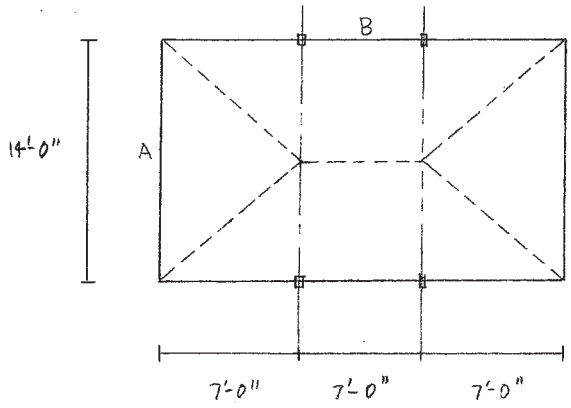
Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: steel tube design DATE

BY: CP CK: SHT: OF

Patio canopy plan.-



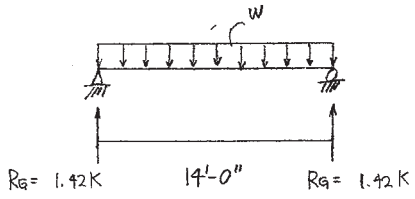
DL = 20 psf

LL = 30 psf

W = 21.5 psf (hor.)

W = 22.5 psf (net uplift)

Beam a:- gravity



trib. width = 3'-6"

DL = 20psf (3.5') = 70 plf

LL = 30 psf (3.5') = 105 plf

Title :
Dsgnr:
Description :

Job #
Date: 12:04PM, 10 MAR 08

61

Scope :

Rev: 580006
User: KW-0606725, Ver 5.8.0, 1-Dec-2003

Steel Beam Design

Description Beam A - gravity

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section : TS6X6X3/8

		Pinned-Pinned		Fy	46.00 ksi
Center Span	14.00 ft	Bm Wt. Added to Loads		Load Duration Factor	1.00
Left Cant.	0.00 ft	LL & ST Act Together		Elastic Modulus	29,000.0 ksi
Right Cant	0.00 ft				
Lu : Unbraced Length	14.00 ft				

Distributed Loads

Note! Short Term Loads Are WIND Loads.

	# 1	# 2	# 3	# 4	# 5	# 6	# 7	
DL	0.070							k/ft
LL	0.105							k/ft
ST								k/ft
Start Location								ft
End Location								ft

Summary

Beam OK
Static Load Case Governs Stress

Using: TS6X6X3/8 section, Span = 14.00ft, Fy = 46.0ksi
End Fixity = Pinned-Pinned, Lu = 14.00ft, LDF = 1.000

	Actual	Allowable
Moment	4.960 k-ft	31.970 k-ft
fb : Bending Stress	4.282 ksi	27.600 ksi
fb / Fb	**0.155 : 1**	
Shear	1.417 k	82.800 k
fv : Shear Stress	0.315 ksi	18.400 ksi
fv / Fv	**0.017 : 1**	

Max. Deflection	-0.145 in
Length/DL Defl	2,406.3 : 1
Length/(DL+LL Defl)	1,158.3 : 1

Force & Stress Summary

<<-- These columns are Dead + Live Load placed as noted -->>

	Maximum	DL Only	LL @ Center	LL+ST @ Center	LL @ Cants	LL+ST @ Cants	
Max. M +	4.96 k-ft	2.39	4.96				k-ft
Max. M -							k-ft
Max. M @ Left							k-ft
Max. M @ Right							k-ft
Shear @ Left	1.42 k	0.68	1.42				k
Shear @ Right	1.42 k	0.68	1.42				k
Center Defl.	-0.145 in	-0.070	-0.145	-0.145	0.000	0.000	in
Left Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
Right Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000	in
Reaction @ Left	1.42	0.68	1.42	1.42			k
Reaction @ Rt	1.42	0.68	1.42	1.42			k

Fa calc'd per Eq. E2-2, K*L/r > Cc

Section Properties TS6X6X3/8

Depth	6.000 in	Weight	27.45 #/ft
Thickness	0.375 in	Ixx	41.600 in4
Width	6.000 in	Iyy	41.600 in4
		Sxx	13.900 in3
Area	8.08 in2	Syy	13.900 in3
Rt	3.000 in	R-xx	2.270 in
Values for LRFD Design....		R-yy	2.270 in
J	68.500 in4	Zx	16.800 in3
		Zy	16.800 in3

Ronald Roberts Associates, Inc.
Consulting Engineers

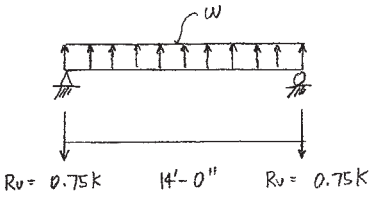
PROJECT: Panda Express JOB NO.

SUBJECT: Steel Tube design DATE

BY: CP CK: SHT: OF

62

Beam A - uplift

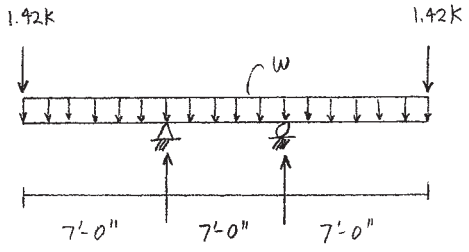


trib. width = 3'-6"

w = 22.5 psf (net uplift)

w = 22.5 psf (3.5') = 79 plf

Beam B - gravity



trib. width = 7'-0"

DL = 20 psf (7') = 140 plf

LL = 30 psf (7') = 210 plf

Title :
Dsgnr:
Description :

Job #
Date: 12:08PM, 10 MAR 08

Scope :

Steel Beam Design

Description Beam A - uplift

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section : TS6X6X3/8

		Pinned-Pinned	Fy	46.00 ksi
Center Span	14.00 ft	Bm Wt. Added to Loads	Load Duration Factor	1.00
Left Cant.	0.00 ft	LL & ST Act Together	Elastic Modulus	29,000.0 ksi
Right Cant	0.00 ft			
Lu : Unbraced Length	14.00 ft			

Distributed Loads

Note! Short Term Loads Are WIND Loads.

	# 1	# 2	# 3	# 4	# 5	# 6	# 7	
DL								k/ft
LL								k/ft
ST	0.079							k/ft
Start Location								ft
End Location								ft

Summary

Beam OK
Short Term Load Case Governs Stress

Using: TS6X6X3/8 section, Span = 14.00ft, Fy = 46.0ksi
End Fixity = Pinned-Pinned, Lu = 14.00ft, LDF = 1.000

	Actual	Allowable
Moment	2.608 k-ft	31.970 k-ft
fb : Bending Stress	2.251 ksi	27.600 ksi
fb / Fb	**0.082 : 1**	
Shear	0.745 k	82.800 k
fv : Shear Stress	0.166 ksi	18.400 ksi
fv / Fv	**0.009 : 1**	

Max. Deflection	-0.076 in
Length/DL Defl	8,543.8 : 1
Length/(DL+LL Defl)	2,202.9 : 1

Force & Stress Summary

<<-- These columns are Dead + Live Load placed as noted -->>

	Maximum	DL Only	LL @ Center	LL+ST @ Center	LL @ Cants	LL+ST @ Cants	
Max. M +	2.61 k-ft	0.67		2.61			k-ft
Max. M -							k-ft
Max. M @ Left							k-ft
Max. M @ Right							k-ft
Shear @ Left	0.75 k	0.19		0.75			k
Shear @ Right	0.75 k	0.19		0.75			k
Center Defl.	-0.076 in	-0.020	0.000	-0.076	0.000	0.000	in
Left Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
Right Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000	in
Reaction @ Left	0.75	0.19		0.75			k
Reaction @ Rt	0.75	0.19		0.75			k

Fa calc'd per Eq. E2-2, K*L/r > Cc

Section Properties TS6X6X3/8

Depth	6.000 in	Weight	27.45 #/ft
Thickness	0.375 in	Ixx	41.600 in4
Width	6.000 in	Iyy	41.600 in4
		Sxx	13.900 in3
Area	8.08 in2	Syy	13.900 in3
Rt	3.000 in	R-xx	2.270 in
Values for LRFD Design....		R-yy	2.270 in
J	68.500 in4	Zx	16.800 in3
		Zy	16.800 in3

Title :
Dsgnr:
Description :

Job #
Date: 12:13PM, 10 MAR 08

Scope :

Steel Beam Design

Description Beam B - gravity

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section : TS6X6X3/8

		Pinned-Pinned	Fy	46.00 ksi
Center Span	7.00 ft	Bm Wt. Added to Loads	Load Duration Factor	1.00
Left Cant.	7.00 ft	LL & ST Act Together	Elastic Modulus	29,000.0 ksi
Right Cant	7.00 ft			
Lu : Unbraced Length	7.00 ft			

Distributed Loads

Note! Short Term Loads Are WIND Loads.

	# 1	# 2	# 3	# 4	# 5	# 6	# 7	
DL	0.140							k/ft
LL	0.210							k/ft
ST								k/ft
Start Location								ft
End Location								ft

Point Loads

Note! Short Term Loads Are WIND Loads.

	# 1	# 2	# 3	# 4	# 5	# 6	# 7	
Dead Load	0.490	0.490						k
Live Load	0.930	0.930						k
Short Term								k
Location	-7.000	14.000						ft

Summary

Beam OK
Static Load Case Governs Stress

Using: TS6X6X3/8 section, Span = 7.00ft, Fy = 46.0ksi, Left Cant. = 7.00ft, Right Cant. = 7.00ft
End Fixity = Pinned-Pinned, Lu = 7.00ft, LDF = 1.000

	Actual	Allowable
Moment	19.187 k-ft	31.970 k-ft
fb : Bending Stress	16.565 ksi	27.600 ksi
fb / Fb	**0.600 : 1**	
Shear	4.030 k	82.800 k
fv : Shear Stress	0.896 ksi	18.400 ksi
fv / Fv	**0.049 : 1**	

Max. Deflection	1.060 in
Length/DL Defl	425.0 : 1
Length/(DL+LL Defl)	158.5 : 1

Force & Stress Summary

<<-- These columns are Dead + Live Load placed as noted -->>

	Maximum	DL Only	LL @ Center	LL+ST @ Center	LL @ Cants	LL+ST @ Cants	
Max. M +	19.19 k-ft						k-ft
Max. M -		-7.53	-7.53		-19.19		k-ft
Max. M @ Left		-7.53	-7.53		-19.19		k-ft
Max. M @ Right		-7.53	-7.53		-19.19		k-ft
Shear @ Left	4.03 k	1.65	1.65		4.03		k
Shear @ Right	4.03 k	1.65	1.65		4.03		k
Center Defl.	0.161 in	0.059	0.049	0.049	0.161	0.161	in
Left Cant Defl	1.036 in	-0.395	-0.360	-0.360	-1.036	-1.036	in
Right Cant Defl	1.060 in	-0.393	-0.367	-0.367	-1.060	-1.060	in
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000	in
Reaction @ Left	7.05	2.25	2.98	2.98	4.65	4.65	k
Reaction @ Rt	7.05	2.25	2.98	2.98	4.65	4.65	k

Fa calc'd per Eq. E2-1, K*L/r < Cc

Description Beam B - gravity

Section Properties TS6X6X3/8

Depth	6.000 in	Weight	27.45 #/ft
Thickness	0.375 in	Ixx	41.600 in4
Width	6.000 in	Iyy	41.600 in4
		Sxx	13.900 in3
Area	8.08 in2	Syy	13.900 in3
Rt	3.000 in	R-xx	2.270 in
Values for LRFD Design....		R-yy	2.270 in
J	68.500 in4	Zx	16.800 in3
		Zy	16.800 in3

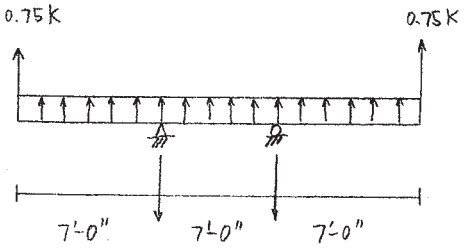
Ronald Roberts Associates, Inc.
Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Steel tube design DATE

BY: CP CK: SHT: OF

Beam B - uplift



trib. width = 7'-0"

W = 22.5 psf (7.0') = 158 plf

Title :
Dsgnr:
Description :

Job #
Date: 12:17PM, 10 MAR 08

Scope :

Steel Beam Design

Description Beam B - uplift

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section : TS6X6X3/8

		Pinned-Pinned		Fy	46.00 ksi
Center Span	7.00 ft	Bm Wt. Added to Loads		Load Duration Factor	1.33
Left Cant.	7.00 ft	LL & ST Act Together		Elastic Modulus	29,000.0 ksi
Right Cant	7.00 ft				
Lu : Unbraced Length	7.00 ft				

Distributed Loads

Note! Short Term Loads Are WIND Loads.

	#1	#2	#3	#4	#5	#6	#7	
DL								k/ft
LL								k/ft
ST	0.158							k/ft
Start Location								ft
End Location								ft

Point Loads

Note! Short Term Loads Are WIND Loads.

	#1	#2	#3	#4	#5	#6	#7	
Dead Load								k
Live Load	0.075	0.075						k
Short Term								k
Location	-7.000	14.000						ft

Summary

Beam OK
Short Term Load Case Governs Stress

Using: TS6X6X3/8 section, Span = 7.00ft, Fy = 46.0ksi, Left Cant. = 7.00ft, Right Cant. = 7.00ft
End Fixity = Pinned-Pinned, Lu = 7.00ft, LDF = 1.330

	Actual	Allowable		
Moment	5.068 k-ft	42.520 k-ft	Max. Deflection	0.268 in
fb : Bending Stress	4.376 ksi	36.708 ksi	Length/DL Defl	5,264.0 : 1
fb / Fb	**0.119 : 1**		Length/(DL+LL Defl)	626.9 : 1
Shear	1.357 k	110.124 k		
fv : Shear Stress	0.302 ksi	24.472 ksi		
fv / Fv	**0.012 : 1**			

Force & Stress Summary

<<-- These columns are Dead + Live Load placed as noted -->>

	Maximum	DL Only	LL @ Center	LL+ST @ Center	LL @ Cants	LL+ST @ Cants	
Max. M +	5.07 k-ft			0.46			k-ft
Max. M -		-0.67	-0.67	-0.67	-1.20	-5.07	k-ft
Max. M @ Left		-0.67	-0.67	-0.67	-1.20	-5.07	k-ft
Max. M @ Right		-0.67	-0.67	-0.67	-1.20	-5.07	k-ft
Shear @ Left	1.36 k	0.19	0.19	0.65	0.26	1.36	k
Shear @ Right	1.36 k	0.19	0.19	0.65	0.26	1.36	k
Center Defl.	0.043 in	0.005	0.005	-0.002	0.009	0.043	in
Left Cant Defl	0.268 in	-0.031	-0.031	-0.009	-0.062	-0.268	in
Right Cant Defl	0.266 in	-0.032	-0.032	-0.009	-0.063	-0.266	in
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000	in
Reaction @ Left	2.65	0.29	0.29	0.84	0.36	1.47	k
Reaction @ Rt	2.65	0.29	0.29	0.84	0.36	1.47	k

Fa calc'd per Eq. E2-1, K*L/r < Cc

Description Beam B - uplift

Section Properties TS6X6X3/8

Depth	6.000 in	Weight	27.45 #/ft
Thickness	0.375 in	Ixx	41.600 in4
Width	6.000 in	Iyy	41.600 in4
		Sxx	13.900 in3
Area	8.08 in2	Syy	13.900 in3
Rt	3.000 in	R-xx	2.270 in
Values for LRFD Design....		R-yy	2.270 in
J	68.500 in4	Zx	16.800 in3
		Zy	16.800 in3

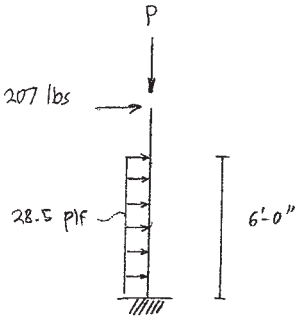
Ronald A. Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: steel columns DATE

BY: CP CK: SHT: OF

Gravity:-



H = 7'-6"

w = 21.5 psf (Char.)

Weight of 1½"x 1½" x ¼" alum. tube = 4.32 lb/ft [(14x2) + (21x2)] = 303 lbs

fabric weight = 10 psf (294 ft²) = 2,940 lbs A = (21')(14') = 294 ft²

weight of TS 6x6x 3/8" = 27.48 lb/ft (70 ft) = 1924 lbs

snow load = 30 psf (294 ft²) = 8820 lbs

P = 13,987 lbs

lateral point loads :- $W_{top} = \left[\left(\frac{(3.5' \times 2.75') + (7' \times 2.75')/2}{2}\right)(21.5\ psf)\right] = 207$ lbs

W @ bot = 21.5 psf (6' x 1.33') = 172 lbs @ 3'-0" or w = 21.5 psf (1.33') = 28.5 plf from 0' to 6'

Steel Column

Description Steel column

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section	**HSS4X4X3/16**	Fy	46.00 ksi	X-X Sidesway :	Restrained
		Duration Factor	1.330	Y-Y Sidesway :	Restrained
Column Height	7.500 ft	Elastic Modulus	29,000.00 ksi		
End Fixity	Fix-Free	X-X Unbraced	7.500 ft	Kxx	1.000
Live & Short Term Loads Combined		Y-Y Unbraced	7.500 ft	Kyy	1.000

Loads

Axial Load...

Dead Load	5.17 k	Ecc. for X-X Axis Moments	0.000 in
Live Load	8.82 k	Ecc. for Y-Y Axis Moments	0.000 in
Short Term Load	k		

Point lateral Loads...

	DL	LL	ST	Height
Along Y-Y (strong axis moments)			0.207 k	7.500 ft
Along X-X (y moments)			k	ft

Distributed lateral Loads...

	DL	LL	ST	Start		End
Along Y-Y			0.029 k/ft		-->	6.000 ft
Along X-X			k/ft		-->	ft

Summary

Column Design OK

Section : HSS4X4X3/16, Height = 7.50ft, Axial Loads: DL = 5.17, LL = 8.82, ST = 0.00k, Ecc. = 0.000in
Unbraced Lengths: X-X = 7.50ft, Y-Y = 7.50ft

Combined Stress Ratios	Dead	Live	DL + LL	DL + ST + (LL if Chosen)
AISC Formula H1 - 1		0.1585	0.2513	0.4298
AISC Formula H1 - 2		0.1239	0.1964	0.3664
AISC Formula H1 - 3	0.0928			

XX Axis : Fa calc'd per Eq. E2-1, K*L/r < Cc
YY Axis : Fa calc'd per Eq. E2-1, K*L/r < Cc

Stresses

Allowable & Actual Stresses	Dead	Live	DL + LL	DL + Short
Fa : Allowable	21.57 ksi	21.57 ksi	21.57 ksi	28.69 ksi
fa : Actual	2.00 ksi	3.42 ksi	5.42 ksi	5.42 ksi
Fb:xx : Allow [F3.1]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
fb : xx Actual	0.00 ksi	0.00 ksi	0.00 ksi	8.03 ksi
Fb:yy : Allow [F3.1]	27.60 ksi	27.60 ksi	27.60 ksi	36.71 ksi
fb : yy Actual	0.00 ksi	0.00 ksi	0.00 ksi	0.00 ksi

Analysis Values

F'ex : DL+LL	44,375 psi	Cm:x DL+LL	0.60	Cb:x DL+LL	1.00
F'ey : DL+LL	44,375 psi	Cm:y DL+LL	0.60	Cb:y DL+LL	1.00
F'ex : DL+LL+ST	59,019 psi	Cm:x DL+LL+ST	1.00	Cb:x DL+LL+ST	1.00
F'ey : DL+LL+ST	59,019 psi	Cm:y DL+LL+ST	0.60	Cb:y DL+LL+ST	1.00

Max X-X Axis Deflection -0.339 in at 7.500 ft Max Y-Y Axis Deflection 0.000 in at 0.000 ft

Description Steel column

Section Properties HSS4X4X3/16

Depth	4.000 in	Weight	8.76 #/ft	Values for LRFD Design....	
Web Thick	0.174 in	Ixx	6.210 in4	J	9.960 in4
Width	4.000 in	Iyy	6.210 in4	Cw	5.07 in6
Flange Thick	0.174 in	Sxx	3.100 in3	Zx	3.670 in3
Area	2.58 in2	Syy	3.100 in3	Zy	3.670 in3
Rt	0.000 in	Rxx	1.550 in		0.000
		Ryy	1.550 in		

Section Type = HSS-Square

General Footing Analysis & Design

Description Trellis footings

General Information

Code Ref: ACI 318-02, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Allowable Soil Bearing	2,900.0 psf	**Dimensions...**	
Short Term Increase	1.330	Width along X-X Axis	2.750 ft
Seismic Zone	4	Length along Y-Y Axis	2.750 ft
		Footing Thickness	12.00 in
Live & Short Term Combined		Col Dim. Along X-X Axis	4.00 in
f'c	3,000.0 psi	Col Dim. Along Y-Y Axis	4.00 in
Fy	60,000.0 psi	Base Pedestal Height	0.000 in
Concrete Weight	145.00 pcf		
Overburden Weight	0.00 psf	Min Steel %	0.0014
		Rebar Center To Edge Distance	3.00 in

Loads

Applied Vertical Load...

Dead Load	5.167 k	...ecc along X-X Axis	0.000 in
Live Load	8.820 k	...ecc along Y-Y Axis	0.000 in
Short Term Load	k		

Applied Moments...	Creates Rotation about Y-Y Axis (pressures @ left & right)	Creates Rotation about X-X Axis (pressures @ top & bot)
Dead Load	k-ft	2.080 k-ft *
Live Load	k-ft	k-ft
Short Term	k-ft	k-ft

Applied Shears...	Creates Rotation about Y-Y Axis (pressures @ left & right)	Creates Rotation about X-X Axis (pressures @ top & bot)
Dead Load	k	k
Live Load	k	k
Short Term	k	k

* $f_b = \frac{M}{S}$

col. M

$M = f_b S$

$M = \frac{8.03\ ksi\ (3.10\ in^3)}{12}$

$M = 2.075\ k\text{-}ft$

Summary

Footing Design OK

2.75ft x 2.75ft Footing, 12.0in Thick, w/ Column Support 4.00 x 4.00in x 0.0in high

	DL+LL	DL+LL+ST		Actual	Allowable
Max Soil Pressure	2,594.6	2,594.6 psf	Max Mu	2.644 k-ft per ft	
Allowable	2,900.0	3,857.0 psf	Required Steel Area		0.259 in2 per ft
"X' Ecc, of Resultant	0.000 in	0.000 in			
"Y' Ecc, of Resultant	1.655 in	1.655 in	Shear Stresses....	Vu	Vn * Phi
			1-Way	15.898	93.113 psi
X-X Min. Stability Ratio	9.971	1.500 :1	2-Way	40.172	186.226 psi
Y-Y Min. Stability Ratio	No Overturning				

use #5 ba (0.31 in²) @ 9" o.c.e t.& b.

Footing Design

Shear Forces	ACI C-1	ACI C-2	ACI C-3	Vn * Phi
Two-Way Shear	40.17 psi	35.39 psi	8.40 psi	186.23 psi
One-Way Shears...				
Vu @ Left	12.47 psi	10.99 psi	2.61 psi	93.11 psi
Vu @ Right	12.47 psi	10.99 psi	2.61 psi	93.11 psi
Vu @ Top	15.90 psi	14.03 psi	3.42 psi	93.11 psi
Vu @ Bottom	9.05 psi	7.95 psi	1.80 psi	93.11 psi

Moments	ACI C-1	ACI C-2	ACI C-3	Ru / Phi	As Req'd	
Mu @ Left	2.14 k-ft	1.89 k-ft	0.45 k-ft	29.4 psi	0.26 in2	per ft
Mu @ Right	2.14 k-ft	1.89 k-ft	0.45 k-ft	29.4 psi	0.26 in2	per ft
Mu @ Top	2.64 k-ft	2.33 k-ft	0.57 k-ft	36.3 psi	0.26 in2	per ft
Mu @ Bottom	1.64 k-ft	1.45 k-ft	0.33 k-ft	22.6 psi	0.26 in2	per ft

Description Trellis footings

Soil Pressure Summary

Service Load Soil Pressures	Left	Right	Top	Bottom
DL + LL	1,994.52	1,994.52	2,594.61	1,394.43 psf
DL + LL + ST	1,994.52	1,994.52	2,594.61	1,394.43 psf
Factored Load Soil Pressures				
ACI Eq. C-1	3,142.21	3,142.21	4,087.61	2,196.82 psf
ACI Eq. C-2	2,792.33	2,792.33	3,632.46	1,952.20 psf
ACI Eq. C-3	745.42	745.42	969.69	521.14 psf

ACI Factors (per ACI 318-02, applied internally to entered loads)

ACI C-1 & C-2 DL	1.400	ACI C-2 Group Factor	0.750	Add"l "1.4" Factor for Seismic	1.400
ACI C-1 & C-2 LL	1.700	ACI C-3 Dead Load Factor	0.900	Add"l "0.9" Factor for Seismic	0.900
ACI C-1 & C-2 ST	1.700	ACI C-3 Short Term Factor	1.300		
....seismic = ST * :	1.100 Used in ACI C-2 & C-3				

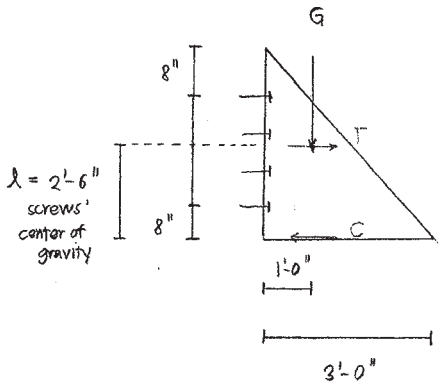
Ronald A Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Window canopies DATE

BY: CP CK: SHT: OF

Gravity.-



Aluminum = 4.32 lb/ft (20ft) = 86 lbs

Fabric = 10 psf (3 ft x 5 ft) = 150 lbs

Snow load = 30 psf (3 ft)(5 ft) = 450 lbs

G = 686 lbs

$M_G = G(1.0') = 686 \text{ lbs}(1.0 \text{ ft}) = 686 \text{ ft·lb}$

$T = C = \frac{M_G}{\ell} = \frac{686 \text{ ft·lb}}{2.5 \text{ ft}} = 275 \text{ lbs}$

3/8" ϕ lag screws length = 1" tvbe + 1/2" sheat. + 3.5" = 5" long

5" long lag screw → T-E = 2-25/32" = 2.78" NDS p166

no penetration factor for withdrawal p58 NDS

withdrawal allow = 305 lbs/in penetration NDS p68

actual penetration into main member (blkg) = 5" - 1" tvbe - 1/2" sheat = 3.5" > 2.78"

∴ full value can be taken

(2.78")(305 lb/in) = 848 lbs per lag screw > T = 275.lbs ∴ o.k. ✓

Ronald Roberts Associates, Inc.
Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Window Canopies DATE

BY: CP CK: SHT: OF

Z = shear

Z = 686 lbs

$Z_i = \frac{686 \text{ lbs}}{4} = 172 \text{ lbs}$

p = 8D = 8(3/8") = 3" to use full value

from table 11K NDS p 94 t = 1/4" , $Z_\perp$ = 180 lbs

Z' = 180 lbs (1.15) = 207 lbs > Z_i = 172 lbs ∴ o.k.

Use 4 - 3/8" ø x 5" long lag screws

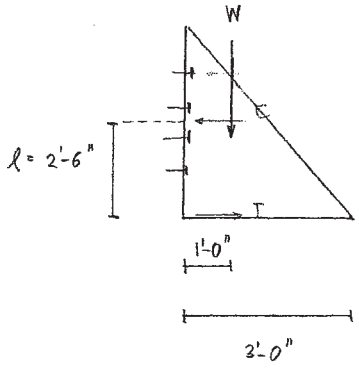
Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Window Canopies DATE

BY: CP CK: SHT: OF

Wind.-



W = 22.5 psf (net uplift)

W = 22.5 psf (3 ft x 3 ft) = 203 lbs

M_W = W(1.0 ft) = 203 lbs (1.0') = 203 ft·lb

$T = C = \frac{M_W}{\ell} = \frac{203 \text{ ft·lb}}{2.5 \text{ ft}} = 81$ lbs

withdrawal W = 305 lbs/in penetration

2.78" (305 lbs/in) = 848 lbs per lag screw > T = 81 lbs ∴ o.k. ✓

Shear.-

Z = W = 203 lbs

$Z_1 = \frac{203 \text{ lbs}}{4} = 51$ lbs

Z' = 180 lbs (1.6) = 288 lbs > z_1 = 51 lbs ∴ o.k.

Use 4 - 3/8" ø x 5" long lag screws

Ronald A Roberts Associates, Inc. Consulting Engineers

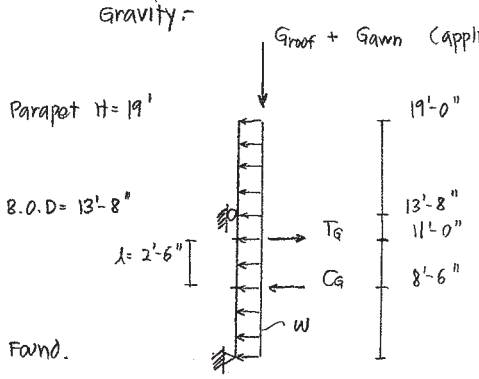
PROJECT: Panda Express JOB NO.

SUBJECT: stud check DATE

BY: CP CK: SHT: OF

77

Gravity:-



T.O. Awning = 13'-6"

$T_G = C_G = 275$ lbs DL = 95 lbs ; LL = 180 lbs

w = 21.5 psf (1.33') = 28.6 plf trib.w. studs @ 16" o.c.

G_{roof} = (20 psf + 30 psf + 39.1 psf) (18 ft) (1.33 ft) = 2138 lbs

G_{awn} = 686 lbs DL = 236 lbs ; LL = 450 lbs

G_{total} = 2824 lbs DL = 480 lbs + 236 lbs = 716 lbs

LL = 1170 lbs

Snow L = 938 lbs

Use 2-2x6 studs @ awnings locations

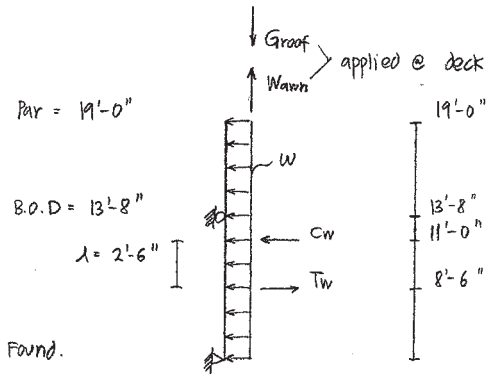
Ref. RISA software output for design analysis.

Ronald Roberts Associates, Inc.
Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: stud design DATE

BY: CP CK: SHT: OF



w = 21.5 psf stud spacing = 16" = trib w.

w = 21.5 psf (1.33') = 28.6 plf

G_{roof} = 2138 lbs (as previous calc.) ; DL = 480 lbs

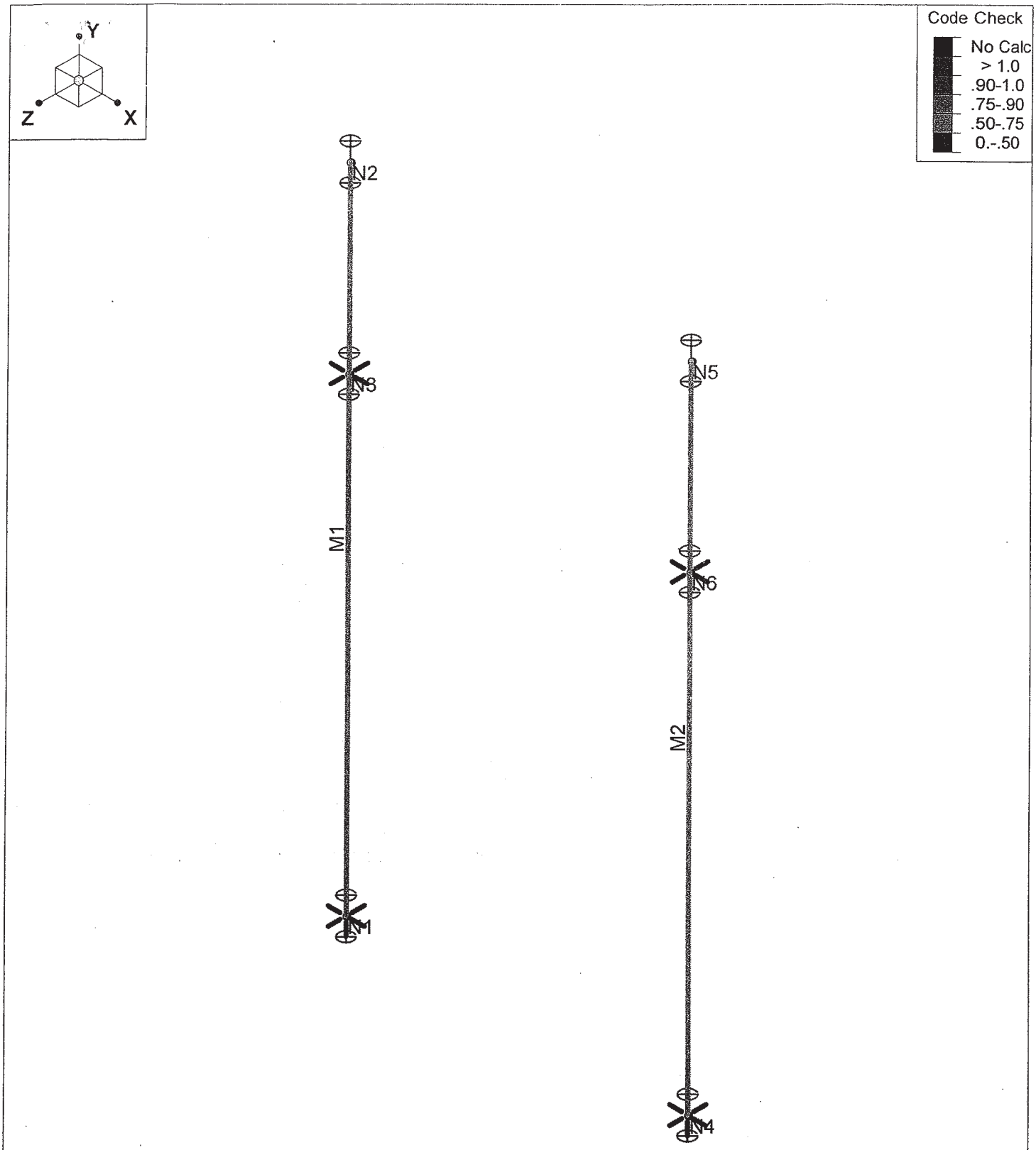
LL = 720 lbs ; SL = 938 lbs

W_{awn} = 22.5 psf (3'x 3') = 203 lbs

$T_w = C_w$ = 81 lbs (due to WL)

Use 2-2X6 studs @ awnings locations

Ref. RISA software output for design analysis.



Solution: Envelope

Ronald A. Roberts Associa...	Stud Check	
CP		Mar 11, 2008 at 2:49 PM
07173	Stud check at awnings	stud check.r3d

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design L...	Material	Design Rules
1	M1	N1	N2			2-2X6	Column	None	DF Larch	Typical
2	M2	N4	N5			2-2X6	Column	None	DF Larch	Typical

Wood Design Parameters

	Label	Shape	Length[ft]	le2[ft]	le1[ft]	le-bend to...	le-bend bo...	Kyy	Kzz	CH	Cr	y sway	z sway
1	M1	2-2X6	19	0	Segment						Yes		
2	M2	2-2X6	19	0	Segment						Yes		

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	19	0	0	
3	N3	0	13.67	0	0	
4	N4	10	0	0	0	
5	N5	10	19	0	0	
6	N6	10	13.67	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N1	Reaction	Reaction	Reaction		Reaction		
2	N2					Reaction		
3	N3	Reaction		Reaction		Reaction		
4	N4	Reaction	Reaction	Reaction		Reaction		
5	N5					Reaction		
6	N6	Reaction		Reaction		Reaction		

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...
1	DL	DL					4			
2	LL	LL					4			
3	Snow	SL					2			
4	Wind	WL					3	2		

Load Combinations

	Description	Solve	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	DL + LL + SL	Yes			1	1	2	1	3	1										
2	DL + 1.3WL	Yes			1	1	4	1.3												
3	DL + 1.3WL ...	Yes			1	1	4	1.3	2	1	3	1								
4	DL + LL + S...	Yes			1	1	2	1	3	1	4	1.3								
5	.9DL	Yes			1	.9														

Member Point Loads (BLC 1 : DL)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.716	13.67
2	M1	X	.095	11
3	M1	X	-.095	8.5
4	M2	Y	-.48	13.67

Member Point Loads (BLC 2 : LL)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-1.17	13.67
2	M1	X	.18	11
3	M1	X	-.18	8.5
4	M2	Y	-.72	13.67

Member Point Loads (BLC 3 : Snow)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.938	13.67
2	M2	Y	-.938	13.67

Member Point Loads (BLC 4 : Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Y	.203	13.67
2	M2	X	-.081	11
3	M2	X	.081	8.5

Member Distributed Loads (BLC 4 : Wind)

	Member Label	Direction	Start Magnitude[k/ft,d...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.029	.029	0	0
2	M2	X	.029	.029	0	0

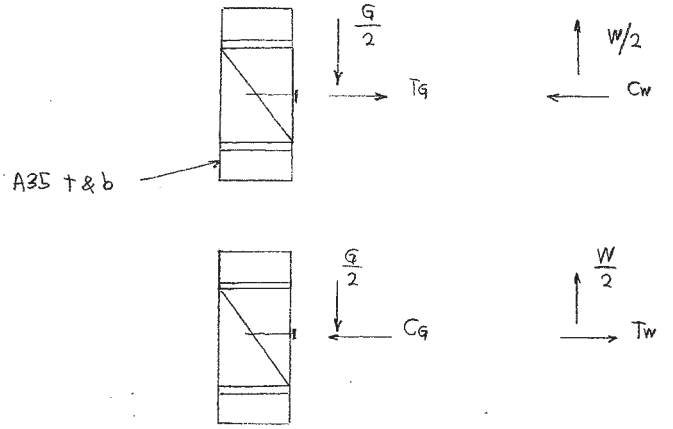
Ronald Roberts Associates, Inc. Consulting Engineers

PROJECT: Panda Express JOB NO.

SUBJECT: Misc. DATE

BY: CP CK: SHT: OF

Blocking :-



Gawning = 686 lbs

W = 203 lbs

$T_G = C_G$ = 275 lbs < 450 lbs ∴ ✓

$T_W = C_W$ = 81 lbs < 450 lbs ∴ o.k. ✓

$\frac{G}{2}$ = 343 lbs < 450 lbs ∴ ✓

$\frac{W}{2}$ = 102 lbs < 450 lbs ∴ ok ✓

Use A35 clip top & bot. of blkg.

Uplift clip for trusses :-

net uplift = 9.1 psf

W = 9.1 psf (2.67') = 24.3 plf

$V = \frac{24.3 \text{ plf} (36 \text{ ft})}{2} = 438 \text{ lbs}$

Use H2.5A Simpson clip allow = 600 lbs

St George City Plan Correction List

2006 International Building Code Plan Review 2nd Review
Date 3/26/08

Business Name	Panda Express
Building Address	3650 West 13400 South
Type of Const.	V B
Building Area	2,475 square feet
Total Area	2,475 square feet
Number of stories	One
Height	26 feet 4 inches
Fire Sprinklered	Yes
Occupancy	A-2
Occupant load	95
Parking stalls	45
Accessible stalls	2
Separation	None
Use	Restaurant
Type of work	Build new restaurant
Owner	
Architect	CMA 817-635-5696 fax 817-635-5699
Engineer	Ronald Roberts Associates 214-637-6299 fax 214-637-6997 rara.net

The following items were found to be in violation of codes, unclear, missing from plans or need further explanation. Please make corrections on plans and prepare a plan review response letter indicating where on plans and what type of corrective action was taken. When all corrections have been made, the plans will be approved and the plan correction list will be attached to the approved plans and become part of the approved construction documents.

Please review items noted " Not corrected " which need further clarification or I could not locate corrective action on plans

Resubmit

Jody Hilton

3. Provide the slope of the ramp and the slope of the side flares for each flared side curb ramp as shown on the site plan **Not corrected clarify slope center portion of curb ramps C4.10 states 1-12 and detail B on page C3.90 states 2 %. Which is correct ?**

4. Provide one van accessible parking stall { 11 foot) 132 inches in width with a 60 inch access aisle 2003 ANSI 117 section 502.2 Site plan detail is different than curb ramp detail on 04-A-03 **Not corrected stall and access aisle area fine and allowable but curb ramp on site plan is still different that curb ramp detail ?**

5. Provide appropriate van accessible parking sign and accessible parking sign with posts **Corrected**

6. Provide a level landing with a 2 % slope maximum on the exterior side of all exterior doors shown on the site plan. **Corrcted**

Building Plan Review

7. Provide soils report **Correted**

8. Provide engineer stamped structural calculations **Corrected but ground snow load and calculations must reflect a 43 lb ground snow load .**

9. Provide engineers stamped plans and calculations for trellis and sun shade including footings, foundation structural frame and connection for trellis and sun shade structure. Please include structural frame and attachment for all window canopies **Corrected**

10. Construction documents must show the use and occupant load for each room or space within the building and total occupant load for this building . 2006 IBC106.1.2 **Corrected**

11. Provide approval of restaurant by SL County Health Department **In process**

12. Provide approval for the location, design, capacity and size of grease trap and sampling manhole by local sewer district or sewer department **Provide approval from Norris Palmer South Valley Waster Treatment**

13. List any or all back flow prevention device and submit to Riverton Water Department for records, inspection and approvals Double check valves area no longer allowed for lawn sprinkler systems .**Corrected**

14. Provide complete and accurate 2006 IECC Com Check Include building envelope, building heat, building service water and lighting loads **Corrected**

15. Show all tempered or safety glass locations **Corrected**

16. Show door threshold height and detail at all exterior exit discharge doors **Corrected**

17. Show panic hardware on both pair of exit doors serving dining area **Corrected**

18. Show floor transitions at different floor covering intersection between dining area and restrooms if any. **Corrected**

19. Provide a self closer on accessible water closet compartment doors and provide a pull, a handle or grasping device on both sides of the water closet compartment door. 2003 ANSI 117 section 604.8.3 **Corrected**

20. Provide vertical grab bar in addition to side grab bar at all accessible water closets. **Corrected**

21. Provide toilet paper dispenser between 7 inches to 9 inches in front of accessible toilets **Corrected**

22. Provide accessible customer counter at bar and at reception counter by main exit door **Corrected**

23. Verify that no ceiling or permanent projection, no hanging, suspended or projecting light fixture, decoration, device or object etc is below 80 inches in any circulation path or area subject to human impact. This applies to wall mounted devices or fixtures that project greater than 4 inches from the wall 2003 ANSI 117 304 Very compliance at all suspended ceiling areas **Correction**

24. Provide type of weather barrier to be installed behind all exterior wall coverings **Corrected**

25. Justify single scupper size which must function as both roof drain and overflow drain. Opening size is not clear and must be sized as to prevent plugging or blockage from debris.. Provide section and detail through scupper **Corrected**

26. Provide or show a 42 inch high parapet wall 60 inch beyond each side of roof scuttle and any roof top equipment less than 10 feet from the roof edge or move to 10 feet away from roof edge **Corrected**

27. All roof top equipment must be anchored to the roof structure to resist seismic, wind and gravity forces including snow and drift forces. Floating or sleepers are not permitted. Provide detail of roof top unit curb connection to roof structure not roof deck. See 2003 IBC 1621 and ASCE 7 for seismic bracing and attachment for equipment **Corrected**

28. Provide Current ICC Evaluation report for EIFS or one coat stucco system to be installed. If system is to be adhesively applied special inspection is required and must be listed with all other required special inspections **Corrected Special inspection is required as per report**

29. Show EIFS terminations at all dissimilar locations and at horizontal terminations and show how water will escape. **corrected**

30. Provide flashing and termination detail at EIFS intersection with cultured stone wainscoat ½ wall & brick veneer or stone **Corrected**

31. Provide specific approval and installation detail for any stucco or EIFS installed in a horizontal application **corrected**

32. Provide ICC Evaluation Report for cultured stone veneer and show manufactures attachment means. Provide flashing between EIFS and cultured stone at all locations . **Not corrected Non ICC approved products as not acceptable. Testing, installation details and procedures must be approved by ICC Evaluation Service. Only cultured stone with an ICC Report will be acceptable**

33. Provide engineer stamped plans specification calculations and design for all window canopy structures and their attachment to the building. Awnings must resist snow, gravity and wind loads. **Corrected & deferred submittal**

34. Provide manufactures installation, flashing and caulking details for exterior storefronts and windows. **Corrected**

35. All signage to be approved by Riverton Planning Department **Corrected**

36. Provide brick veneer attachment details and show foundation metal base flashing and weep holes **Corrected No brick**

37. Provide unprotected wood stud with redwood or treated sill plates 8 inches above surrounding grade as per IBC **Corrected**

38. Provide a minimum of 30 inches below frost for footings. **Corrected**

39. Provide complete seismic bracing details for suspended ceilings **Corrected**

40. Provide UL listing for a Class C roof covering assembly and product name & approvals for membrane roofing and 3 inch rigid foam plastic roofing insulation which must be tested together as a Class C roof covering assembly **Corrected**

41. List all cooking equipment and show under Type I hoods or justify the lack thereof. **Corrected**

42. Provide information on UL listed grease hoods, grease filters, exhaust fans etc..**Corrected**

43. Provide and justify opening size for combustion air openings for gas fired water heater . **Not corrected 2006 IFGC requires 50 cubic feet per 1,000 btus standard method for required volume of area Please include all gas fires pieces of equipment in the same room or provide**

44. Provide 2 seismic straps for water heaters **Corrected**

45. Show actual walls and construction types that surround kitchen hoods and grease ducts provide 18 inch clearance if combustible construction **Corrected Metal studs**.

46. Show wall types hoods will be attached to and show required clearance or required protective metal surface material and its required 18 inch installation behind hood and 18 beyond all sides top and bottom. **Not corrected or shown on this plans Plans appear to be for current UMC which is different than 2006 IMC**

47. Provide actual detail of ceiling in relationship to kitchen hoods and protect hood as if a grease duct if hood penetrates ceiling **Corrected**

48. Provide capture and containment test, performance test for all type I grease hoods and new grease duct leak test (before duct wrap or concealment within shaft) 2006 IMC 506.3.3.1 **Corrected**

49. Provide for all grease duct roof top exhaust fans a hinged joint one side and a flexible conduit electrical connection for opening to allow for cleaning and inspection purposes 2006 IMC **Corrected**

50. Type 1 grease hood that is installed or above or concealed or penetrates a ceiling must be protected as if a concealed grease duct. Provide duct wrap and attachment details for all portions of all grease hoods installed above the ceiling line 2006 IMC sections 507.10 & 506.3.10 **Corrected**

51. Provide complete gas line schematic showing gas pressure design and the longest gas line run and total CFH **Corrected**

52. Duct wrap on all grease ducts or one hour fire rated shaft must continue to a point 18 inches above roof line or from any combustible material or construction. Such as roof insulation, roof membrane, insulation etc. **Corrected**

53. Provide ICC Evaluation report grease duct wrap include installation details **Corrected**

54. 2006 IMC 507.2.1 Provide interlock , device or means that will automatically operate grease hood exhaust fan and make up air fan upon activation of cooking equipment **Corrected**

55. Provide interlock between make up air unit and grease hood exhaust fan showing simultaneous operation Provide interlock means or method **Corrected**

56. Will make up air unit provide tempered air within 10 degrees of kitchen room temperature ? **Corrected**

57. Provide or verify that emergency powered or battery back up exit lighting has been provided on the exterior side of the building adjacent exterior exit discharge doors at all required exit doors. IBC 1006.3 Item 5 **Corrected**

58. Verify or clarify on plans that emergency lighting has been provided in dining area where two exits are required IBC 2003 1006.3 Item 1 **Corrected**

59. Verify that horn strobe warning devices have been installed **Corrected Not required**

60. Provide the name of the approved fabricator for steel columns and brackets saddles etc..**Corrected**

61. Provide R ratings and U values of all insulation and windows. Show if insulation is unfaced and if faced show type and if in compliance with flame spread ratings and smoke development ratings.**Corrected**

62. Structural engineer to provide truss or joist connection based on given truss loading and bearing capacity **Corrected**

63. Engineer to list all required special inspection as per the 2006 IBC and all required or provided testing **Corrected**

64. Special inspection agency to be approved by building official. **Corrected**

65. Romex wiring is not allowed above suspended ceilings **Corrected**

66. Verify sediment traps have been installed ahead of all gas appliances**Corrected**

67. Provide water hammer arrestor **Corrected**

68. Floor drains in restrooms require trap primers **Corrected**

Re-submit

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Carter Burgess

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Dallas, TX 75247
Main: 214-920-8100
Fax: 214-688-0618

We are sending you these items via: (FedEx Priority)

Attention:	Linda Gustaveson	**Date:**	3.20.2008
	Riverton Building Department	**Project No:**	024246.013.500.9999
	12830 S. 1700 West	**Re:**	Panda Express
	Riverton, Utah 84065		Riverton, Utah
Phone:	214.920.8100		

COPIES	DATE	DESCRIPTION
1	3.20.2008	Comment Response Letter 3.20.08
2	3.20.2008	Sets, Revised Construction Drawings 3.6.08
2	3.20.2008	Structural Calculations 5.23.07, Rev 3.6.08
1	3.20.2008	Com Check Envelop Compliance Certificate
1	3.20.2008	Geotech (Soils Report) - Terracon, Inc. 2.21.07
1	3.20.2008	Lone Star Stone Mfr. Installation Specifications
1	3.20.2008	Lone Star Stone Installation Guide
1	3.20.2008	CalPly - Dryvit ICC Report ESR - 1547 & Installation Details (Submittal)
1	3.20.2008	Johns-Manville Roofing System Bur Submittal
1	3.20.2008	Kawneer Storefront Specifications
1	3.20.2008	Global Stainless Steel Toilet Partition Submittal
1	3.20.2008	3M Fire Barrier Ducct Wrap - ICC Report ESR - 1255
☐	For approval	
☒	For your use	
☐	For review & comment	
☐		

REMARKS: If you have any questions or are in need of any further information please contact me at 214.920.8100.

Thank you,
Dane Ridenour